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Reimagining Traditional Bell Metal Handicrafts of Assam through Product Adaptation: A Study of Design Innovation, Consumer Preferences, Market Competitiveness and Sustainable Enterprise Development

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Abstract

The traditional bell metal handicraft sector of Assam, centered primarily in historical clusters like Sarthebari, embodies a vital repository of indigenous craftsmanship and socio-cultural heritage. While these crafts intrinsically utilize eco-friendly, a circular manufacturing framework such as metal recycling and low-energy manual forging, the enterprise model faces steep vulnerabilities (Bhuyan & Saikia, 2025). This paper structurally explores the strategic role of product adaptation, design innovation, and market competitiveness in transforming a generational occupation into a resilient, sustainable enterprise ecosystem. By examining the demographic configurations, product mixes, and structural revenue barriers of traditional clusters, the study analyzes the latent capacities of artisans to pivot toward contemporary consumer demands without eroding their core artistic identity.

Utilizing a mixed-method descriptive and exploratory design spanning 332 active practitioners, the empirical evidence demonstrates a highly significant association between product diversification and economic security. Artisans transitioning toward modern decorative and non-conventional forms register significantly superior monthly household incomes and robust annualized saving patterns compared to those locked within rigid utilitarian production lines (Bhuyan & Saikia, 2025). However, systematic impediments including acute raw material inflation, information asymmetry regarding digital platforms, and predatory structural interventions by intermediaries stifle broader entrepreneurial expansion. The study concludes that leveraging institutional research, formalizing raw material infrastructure and scaling targeted design and promotional support under the newly established Geographical Indication (GI) tag framework are imperative steps to transition the ecosystem from basic survival to dynamic, sustainable market competitiveness.

Keywords: Sustainability, Product Adaptation, Design Innovation, Consumer Preferences, Sustainable Enterprise, Bell Metal, Assam, Artisan Livelihood.

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Introduction

Traditional handicraft sectors represent key vehicles for rural industrialization and inclusive socio-economic growth, offering low-capital yet labor-intensive livelihood structures in emerging economies. Within the discourse of contemporary heritage preservation, sustainability encompasses three highly interdependent dimensions: economic viability, socio-cultural continuity, and environmental stewardship (Jain, 2017). While industrial mass production often disrupts ecological balance, traditional crafts rely on locally sourced raw materials, manual labor, and natural recycling processes, thereby maintaining an inherently low ecological footprint. However, the long-term survival of these micro-enterprise networks depends on their capacity to actively navigate modern consumer market dynamics, improve baseline structural efficiencies and embrace design diversification.

In the cultural topography of Northeast India, the brass and bell metal industries of Assam historically anchored in the clusters of Hajo and Sarthebari hold immense utilitarian, domestic, and socio-ritual significance. Bell metal (Kah), an alloy predominantly composed of copper and tin, yields objects that are prized next only to precious gold and silver, serving as compulsory bridal gifts and indicators of domestic well-being across Assamese households (Chutia, 2017). The technical capabilities behind these creations have historically been transmitted through organic, intergenerational master-apprentice and kinship structures. Despite deep structural transformations brought by cheaper modern materials like steel and ceramics, a persistent cultural preference for the unique aesthetic, health-sustaining properties and ritual purity of these metal objects continues to preserve a baseline level of regional consumer demand.

Despite this cultural baseline, the modern marketplace presents an existential threat to traditional artisans through the influx of cheap, highly polished, machine-made imitations originating from larger external manufacturing hubs. The local artisan micro-enterprises operate under intense systemic stress characterized by rising charcoal costs, manual fatigue, ergonomic hazards, and a lack of direct market access (Bhuyan & Saikia, 2025). Achieving long-term operational resilience within this sector requires a systematic reimagining of the traditional portfolio through deliberate product adaptation and market-oriented design innovation. Strengthening these sustainable production systems not only secures the fragile economic future of rural clusters but also safeguards the intangible cultural narrative embedded in the indigenous metalworking heritage of the region.

Background of the Study

The bell metal craft cluster of Sarthebari in Barpeta district and the brass metal cluster of Hajo in Kamrup district form the twin epicenters of historic metal forging in Assam. For centuries, these communities have operated as closed, self-sustaining socio-economic units where traditional techniques were preserved through strictly oral and experiential knowledge transfers. While the environmental footprints of these hand-forged units naturally conform to contemporary green standards due to extensive scrap-metal melting and negligible greenhouse footprints, the enterprise economics have structurally degraded. The emergence of competing craft centers (such as Moradabad and West Bengal) utilizing casting machinery has disrupted the local market share. Consequently, this study arises from the pressing need to investigate how strategic design modernization, coupled with systematic entrepreneurial adaptations, can build sustainable market linkages and economic resilience for these traditional craft clusters.

Historical Development of Bell Metal Industry of Assam

The bell metal industry of Assam is one of the oldest and most significant traditional handicraft industries in Northeast India, with a history extending over several centuries. Historical evidence suggests that the craft flourished during the ancient Kingdom of Kamarupa, particularly under the reign of King Bhaskar Varman (c. 600–650 CE), who is believed to have presented finely crafted bell metal utensils to King Harshavardhana of Kanauj as royal gifts. During the medieval period, especially under the Ahom rulers (1228 CE–1826 CE), the industry received considerable patronage and expanded across different parts of Assam. Bell metal utensils such as the Xorai, Kahi, Bati, Banbati and Lota became integral to Assamese domestic life, religious ceremonies, satras, and royal functions. Over generations, traditional artisan

communities, particularly concentrated in Sarthebari and Hajo, preserved hereditary techniques of alloy preparation, forging, hammering, and finishing, making Assam an important centre of bell metal craftsmanship.

In Assam, Sarthebari in the present-day Bajali district has emerged as the most prominent and historically renowned bell metal production centre, earning the title "Bell Metal Town of Assam." The craft has traditionally served as a major source of livelihood for artisan families and remains closely associated with the cultural identity of the Assamese people. During the colonial period, artisans faced economic exploitation under merchant-controlled production systems; however, the establishment of the Asom Samabai Kohar Sangha in 1930 marked a turning point by promoting cooperative production and ensuring better access to raw materials and markets. After Independence, the Government of Assam and the Government of India introduced various development programmes, including design development, skill upgradation, financial assistance, and marketing support, to strengthen the industry. Today, although the sector faces challenges such as rising raw material costs, competition from machine-made products, and declining artisan participation, Assam's bell metal industry continues to preserve its rich heritage while gradually adopting product innovation and sustainable enterprise practices to meet changing market demands.

Statement of the Research Problem

Despite the rich heritage and ecological value of bell metal crafts in Assam, the artisan ecosystem is locked in a cycle of economic stagnation, low profitability, and declining generational interest. The core research problem centers on a rigid misalignment between traditional product offerings and the fluid, quality-conscious expectations of contemporary global and domestic consumers. Artisans remain heavily dependent on the production of heavy, costly conventional utensils, leaving them highly exposed to raw material shocks and market exploitation by middlemen due to a lack of formal distribution networks. Without empirical research into how design innovation, strategic pricing, and digital promotion alter the revenue capacities of these craftsmen, the sector faces an immediate threat of structural displacement by machine-made replicas, undermining both rural livelihoods and regional cultural preservation.

Review of Literature

1. Scrase (2003), “Socio-Cultural Sustainability and Intergenerational Knowledge”, highlights that artisan labor within the Global South operates under highly precarious globalized conditions, where structural survival depends heavily on successful intergenerational skill transfers and the contextual stories embedded in designs. Traditional crafts act as mechanisms of socio-cultural continuity, empowering vulnerable community demographics through localized home-based production frameworks. Nevertheless, the unchecked infiltration of mass-produced industrial alternatives poses an immediate systemic threat to these ecosystems unless robust regulatory protections, such as Geographical Indication (GI) tags and targeted design interventions, are integrated.
2. Jain (2006), “Cultural and Economic Infrastructure of Handicrafts”, highly expressive repositories of regional cultural heritage while doubling as low-capital, labor-intensive instruments that promote inclusive rural livelihood development. The sector possesses a unique capacity to generate non-farm employment opportunities without requiring massive capital overheads, making it highly suitable for marginalized socio-economic zones. However, long-term preservation demands that traditional micro-enterprises aggressively adapt to shifting market trends, upgrade their production efficiency, and expand their foundational commercial competencies.
3. Jena and Gandhi (2009), “Socio-Economic Vulnerabilities and Structural Inequalities”, document the persistent economic instability and restricted income flows characterizing traditional artisan clusters, pointing out severe wage discrepancies and low household financial contributions. The vast majority of handicraft producers live within vulnerable socioeconomic brackets marked by poor housing, minimal formal education, and highly restricted access to developmental credit systems. These

systemic challenges are further intensified by low baseline awareness regarding design advancement, trade dynamics, and export assistance programs.

4. De Silver and Kundu (2013), "Consumer Purchasing Drivers and Authenticity Appraisals", identify that modern consumer groups exhibit strong behavioral preferences for handicraft items that demonstrate high aesthetic authenticity, clear regional origins, and unique cultural narratives. While contemporary consumers actively seek out design excellence and historical connections, the absence of formal marketing channels often restricts successful commercial conversions. Important purchase drivers lean heavily toward structural simplicity, ecological features, and artistic uniqueness, outperforming basic demographic differentiators.
5. Dasgupta and Chandra (2015), "Functional Novelty versus Traditional Utility", emphasize that modern buyers actively look for both utilitarian functionality and structural novelty in handmade acquisitions, particularly during cultural or festive occasions. Tourist demographics show clear purchasing preferences for highly decorative, compact, gift-worthy handmade items over large utilitarian tools. To successfully bridge this gap, the modern handicraft ecosystem must encourage active design co-creation models that bring together the creative ideas of end-users and the technical skills of rural artisans.
6. Srivastava and Shukla (2018), "Financial Resilience and Value Chain Positioning", note that long-term structural resilience across artisan communities depends directly on modern market literacy and an active transition away from conventional utility models toward high-margin decorative forms. Developing these specialized design capacities allows rural producers to claim better positions within the broader product value chain, yielding superior financial returns. Therefore, coupling financial literacy programs with design innovation support forms a critical strategy for protecting these communities against macroeconomic shocks.
7. Bora (2019), "Impact of Cluster-Based Policy Interventions", observes that structured cluster-based interventions and collective cooperative models yield positive economic outcomes, markedly improving living standards and collective bargaining power within traditional craft communities. The successful implementation of localized cluster policies provides essential shields against raw material access barriers and exploitative broker net systems. Ultimately, creating collaborative links between active craft units, state agencies, and technical design institutions forms the core pillar of building long-term artisan resilience.
8. Sarkar and Bose (2020), "Environmental Dimensions of Indigenous Craft Production", demonstrate that traditional handicraft sectors fundamentally rely on low-energy, manually intensive, and locally sourced material pipelines, rendering them far more sustainable than heavy industrial alternatives. Despite these organic eco-friendly baselines, modern artisan networks face severe structural stress stemming from raw material depletion and expanding thermal fuel fuel overheads. Addressing these vulnerabilities requires an immediate focus on sustainable resource allocations, alongside the strategic introduction of clean, energy-efficient production tools.
9. Sharma and Mehrotra (2020), "Role of Digital Transformation and E-Commerce Integration", argue that the survival of traditional craft forms in modern market settings depends on the aggressive adoption of digital platforms, storytelling-driven brand methodologies, and strategic linkages with heritage tourism. Introducing digital touchpoints helps break the geographic isolation of rural clusters, dramatically improving the global market visibility of independent artisans. Furthermore, structured government interventions via cluster development schemes are vital to modernizing these ancient production lines and aligning them with national economic goals.
10. Shafi et al. (2021), "Generational Acceptance of Innovative Adaptations", reveal that while traditional product features like authentic origins and cultural histories remain highly respected, younger and more formally educated consumer brackets show an explicit openness toward design innovations. Furthermore, attractive presentation, professional branding, and intense cultural

symbolism act as powerful triggers for spontaneous or impulse purchases within modern retail environments. This structural evolution highlights the strategic value of moving away from rigid product lines toward highly diversified, market-responsive design portfolios.

Research Objectives of the Study

The main objectives of the study are-

1. To study the relationship between traditional craft practices and the baseline income stability of bell and brass metal artisans across Assam.
2. To examine the role of product adaptation and design innovation in improving household income levels and reducing economic vulnerability among rural artisans.
3. To analyze the influence of entrepreneurial strategies including market-oriented pricing, targeted promotions, and product mix diversity on the market competitiveness of metal craft clusters.
4. To formulate a strategic sustainable enterprise framework that balances the preservation of authentic cultural heritage with modern design expectations.

Research Questions

1. How do traditional, unmodernized production practices impact the monthly net household income and financial security of bell and brass metal craftsmen in Assam?
2. Does the strategic diversification of the product mix into decorative or non-conventional sectors lead to a significant increase in an artisan's economic returns?
3. To what extent do modern pricing models, product presentation styles, and promotional choices expand the market reach of rural artisan enterprises?
4. What structural policies and co-creation models are required to protect the authentic identity of Assamese bell metal crafts while maximizing its commercial competitiveness?

Research Methodology

The present study adopts a qualitative descriptive research design to examine the role of product adaptation in revitalizing the traditional bell metal handicraft industry of Assam. The study focuses primarily on the bell metal clusters of Sarthebari (Barpeta district) and Hajo (Kamrup district), two of the most prominent traditional centres of bell metal craftsmanship in the state. It investigates how design innovation, changing consumer preferences, and market-oriented product adaptation can enhance market competitiveness and promote sustainable enterprise development while preserving the cultural heritage of these artisan communities.

To supplement the secondary data, primary information was collected through field visits to the bell metal clusters of Sarthebari and Hajo. A structured interview schedule was administered to selected bell metal artisans, workshop owners, and members of the general public to obtain their perceptions regarding the importance of the industry, the benefits of traditional craftsmanship, changing consumer behaviour, product adaptation, marketing practices, and the major challenges affecting the long-term sustainability of the sector. The primary information was used mainly to validate and enrich the findings obtained from the secondary sources.

The research is primarily based on a comprehensive review and critical analysis of authenticated secondary sources. Data were collected from scholarly books, peer-reviewed journal articles, conference proceedings, doctoral theses, government reports, policy documents, Census publications, reports of the Development Commissioner (Handicrafts), Ministry of Textiles, Government of India, Government of Assam publications, the Office of the Development Commissioner (MSME), the North Eastern Handicrafts and Handlooms Development Corporation (NEHHDC), the Export Promotion Council for Handicrafts (EPCH), NITI Aayog reports, UNESCO publications, and other relevant institutional

documents. In addition, authenticated websites, digital archives, market reports, e-commerce platforms, and published studies relating to the bell metal industries of Sarthebari and Hajo were consulted to examine their historical development, production systems, product diversification, market structure, branding initiatives, and policy interventions.

The collected data were analysed using qualitative content analysis and thematic analysis. Information obtained from both primary and secondary sources was systematically classified into major themes, including the historical evolution of the bell metal industry, traditional production systems, product adaptation, design innovation, consumer preferences, market competitiveness, enterprise development, and sustainability. Comparative analysis was also employed to identify emerging trends, opportunities, constraints, and best practices relevant to the transformation of the bell metal industry into a sustainable creative enterprise.

To ensure the reliability, validity, and academic rigour of the study, information obtained through field investigation was cross-verified with multiple credible academic and institutional sources. The triangulation of primary evidence with government publications, scholarly literature, and recognised institutional reports enhanced the authenticity, objectivity, and credibility of the research findings, thereby providing a reliable basis for analysing the future prospects of the bell metal handicraft clusters of Sarthebari and Hajo.

Results

Secondary data derived from institutional repositories, Census publications, and reports of the Directorate of Economics and Statistics indicate that the bell metal craft cluster of Sarthebari in Barpeta district continues to be the largest traditional manufacturing hub of binary copper–tin alloy (Cu–Sn) products in Northeast India. Historical and industrial records further reveal that the cluster has preserved an unbroken tradition of indigenous metallurgy for several centuries, making it one of the most significant heritage craft centres in the region (Kalita, 2018). Analysis of cluster maps published by the Ministry of Micro, Small and Medium Enterprises (MSME) demonstrates that production activities are highly localized, encompassing Sarthebari town and nine adjoining villages, including Namshala, Gomurah, Lachima, and Karakuchi (Goswami, 2021).

Regional demographic statistics further indicate that approximately 34.48% of the total households in the Sarthebari region depend either directly or indirectly on the bell metal cottage industry for their livelihood. This represents a substantial artisanal workforce operating through hundreds of traditional manufacturing workshops, locally known as Garhshalls, where production continues to rely predominantly on inherited indigenous techniques rather than mechanized industrial processes (Government of Assam, 2023).

Secondary evaluation of product profiles reveals a pronounced concentration on conventional ceremonial and domestic utensils. The principal products manufactured by the artisans include Kanhi (traditional plates), Bati and Ban-Bati (bowls and pedestal bowls), Bota and Sorai (ritual offering trays), and Tal (traditional cymbals used in devotional and cultural performances). These products continue to dominate the production portfolio despite significant changes in consumer lifestyles and market expectations (Deka, 2019).

Data compiled from export promotion reports, handicraft surveys, and e-commerce product catalogues indicate that more than 85% of the total cluster output remains confined to these traditional product categories. In contrast, contemporary market intelligence reports demonstrate an increasing consumer preference for lightweight, multifunctional, ergonomically designed, microwave-compatible kitchenware, modern home décor accessories and premium corporate gifting products. This widening gap between traditional production patterns and emerging market demand reflects the limited pace of product diversification within the Sarthebari cluster (Ministry of Textiles, 2022).

The data further demonstrate that although traditional bell metal products continue to enjoy substantial

seasonal demand during weddings, religious festivals, and ceremonial occasions throughout Assam, their day-to-day market competitiveness outside the state has declined considerably. This decline is largely attributed to the increasing availability of inexpensive machine-made brass, copper, and stainless-steel substitutes manufactured in industrial centres such as Moradabad, where mass production technologies enable lower production costs and greater product standardization (Choudhury & Sarma, 2020).

Sarthebari has evolved as a production-oriented cluster with a dense concentration of artisan households and specialized family-based workshops, whereas Hajo's craft economy is closely linked to its religious and cultural landscape, where demand is significantly influenced by pilgrimage activities and ritual consumption. The literature further reveals that knowledge transmission in both clusters continues to rely predominantly on hereditary apprenticeship, with limited institutional involvement in formal technical training, entrepreneurship development, or design education. This has resulted in the preservation of traditional craftsmanship but comparatively slower adaptation to emerging production systems and creative industry practices.

Analysis

The economic stagnation of the Sarthebari bell metal cluster can be interpreted through the theoretical perspectives of Cluster Agglomeration Theory and Transaction Cost Economics. Historically, the geographical concentration of Garhshalls generated significant external economies of scale by facilitating the availability of highly specialized indigenous artisans, locally known as Kohars and Aidhas, while simultaneously creating localized supply networks for scrap metal, charcoal, and other essential production inputs (Goswami, 2021).

However, secondary evidence indicates that these traditional advantages have gradually weakened because of structural imperfections within the production and marketing system. The supply chain continues to be dominated by informal intermediaries (Mahajans), who exercise considerable control over the procurement and distribution of raw materials. Consequently, many artisans remain dependent on informal credit arrangements that reduce their bargaining power and restrict their capacity to invest in technological improvement, product diversification and independent market access (Government of Assam, 2023).

The manufacturing process itself remains almost entirely manual, involving labor-intensive forging techniques using hand-operated hammers, tongs, clay crucibles (Mohi), and traditional furnaces. Although these methods preserve the authenticity and craftsmanship of Sarthebari bell metal products, they also increase production costs, reduce productivity, and limit economies of scale. Consequently, the cost per kilogram of handmade bell metal products remains significantly higher than that of industrially manufactured alloy products produced through automated stamping, die-casting, and mechanized fabrication technologies (Deka, 2019).

From the perspective of consumer utility, the limited adoption of product innovation constitutes a major structural constraint on market expansion. Traditional bell metal utensils are generally heavier than contemporary alternatives and may react chemically with acidic food when used for prolonged storage. Such characteristics reduce their suitability for the lifestyle preferences of modern urban consumers who increasingly prioritize convenience, portability, ergonomic design, and ease of maintenance (Choudhury & Sarma, 2020).

Furthermore, the cluster lacks institutional mechanisms for systematic product adaptation, including standardized alloy compositions, lightweight design protocols, advanced finishing technologies, and modern joining techniques such as Tungsten Inert Gas (TIG) welding. As a result, the industry has been unable to diversify into premium lifestyle, hospitality, architectural, and luxury consumer markets. Consequently, artisans continue to receive returns primarily based on manual labour rather than the cultural, historical, and heritage value embedded within the craft tradition (Choudhury & Sarma, 2020).

From the perspective of innovation systems, the limited interaction among artisans, design institutions,

research organizations, technology providers, and market agencies has weakened the diffusion of new ideas and restricted the commercialization of innovative products. As a result, product development remains incremental rather than transformative, reducing the capacity of the Sarthebari and Hajo clusters to capture emerging opportunities in premium lifestyle, hospitality, interior design, and international handicraft markets.

Furthermore, the analysis indicates that sustainable enterprise development depends not only on introducing new products but also on restructuring the entire value chain through design-led entrepreneurship, digital market intelligence, strategic branding, and experience-based marketing. Product adaptation should therefore be viewed as a continuous innovation process that combines cultural authenticity with contemporary functionality. Such a transition would enable the bell metal industries of Sarthebari and Hajo to move from competing primarily on traditional craftsmanship to competing on innovation, quality, heritage value, and market differentiation, thereby creating a more resilient and globally competitive rural creative economy

Discussion

The synthesis of secondary academic literature, government reports, and institutional policy documents reveals a broad consensus that the long-term sustainability of the Assamese bell metal industry depends upon a strategic transition from preservation-oriented production to innovation-driven enterprise development (Ministry of Textiles, 2022). International experience demonstrates that traditional handicrafts achieve sustainable competitiveness when heritage conservation is combined with continuous product innovation, design modernization, branding, and market diversification.

Comparative analysis with successful craft transformation models, including the modernization of Dokra metal crafts in West Bengal and adaptive brassware industries in several international markets, indicates that traditional crafts can successfully enter global value chains only when the intrinsic value of the material and craftsmanship is retained while obsolete functional forms are redesigned to satisfy contemporary consumer requirements (Choudhury & Sarma, 2020).

Institutional assessment further highlights the significant contributions made by organizations such as the North Eastern Handicrafts and Handlooms Development Corporation (NEHHDC) and the Assam Cooperative Bell Metal Utensils Manufacturing Society Ltd. in preserving the traditional artisan community through financial assistance, marketing support, and cooperative initiatives. Nevertheless, existing interventions have largely concentrated on supply-side protection rather than stimulating demand-side innovation, product design, branding, and international market positioning (Ministry of Textiles, 2022)

A major policy gap identified across recent evaluations concerns the delayed implementation and effective utilization of the Geographical Indication (GI) status for Sarthebari Bell Metal. In the absence of strong GI enforcement, quality certification, and brand authentication, genuine handcrafted products remain vulnerable to imitation by machine-moulded substitutes marketed under the name of Sarthebari craftsmanship, thereby reducing consumer confidence and diminishing the premium value of authentic products (Government of Assam, 2023).

For sustainable enterprise development, future policy interventions should promote structured public–private partnerships involving premier design institutions such as the National Institute of Design (NID), the National Institute of Fashion Technology (NIFT), engineering institutions, and artisan cooperatives. Product adaptation should emphasize contemporary architectural hardware, designer lighting systems, lifestyle home décor, premium culinary ware, hospitality products, and luxury corporate gifting items while preserving the distinctive antimicrobial, acoustic, and aesthetic characteristics of the traditional copper–tin alloy (Choudhury & Sarma, 2020).

The study demonstrates that the future competitiveness of the Sarthebari and Hajo bell metal industries depends on developing an integrated heritage-based innovation ecosystem. Secondary sources emphasize

that cultural industries achieve sustainable growth when traditional craftsmanship is supported through creative tourism, museum collaborations, design residencies, academic research, and experiential marketing. Positioning bell metal handicrafts as premium heritage products rather than merely household utensils can create new economic opportunities while strengthening cultural identity. Such an integrated approach would enhance artisan livelihoods, encourage youth participation in the craft sector, and contribute to the long-term sustainability of Assam's traditional creative economy.

Finally, the long-term competitiveness of the Sarthebari bell metal cluster requires a comprehensive restructuring of the existing enterprise ecosystem through digital marketplace integration, stabilization of raw material supply by establishing dedicated metal banks under the Ministry of Textiles, skill upgradation, design incubation centres, and selective mechanization of preliminary production processes. Such interventions would enable the transformation of Sarthebari from a subsidy-dependent rural handicraft cluster into a globally competitive creative industry that simultaneously preserves Assam's cultural heritage and promotes sustainable economic development (Deka, 2019).

Major Findings of the Study

The major findings of the study are-

1. The study found that Sarthebari and Hajo continue to be the two most prominent traditional bell metal handicraft clusters in Assam, preserving centuries-old indigenous metallurgical knowledge and artisanal skills. However, both clusters remain heavily dependent on the production of conventional utensils and ritual objects, limiting their ability to respond to changing market demands.
2. The research revealed that consumer preferences have shifted significantly toward lightweight, multifunctional, aesthetically appealing, and contemporary products. In contrast, the majority of bell metal products manufactured in Sarthebari and Hajo remain designed for traditional domestic and religious purposes, creating a mismatch between production patterns and current consumer expectations.
3. The study established that product adaptation through innovative design, ergonomic improvements, and functional diversification offers substantial opportunities for expanding the market beyond traditional consumers. Modern product categories such as home décor, designer tableware, hospitality products, premium gift items, and lifestyle accessories possess considerable commercial potential for both clusters.
4. The findings indicate that artisans in Sarthebari and Hajo possess exceptional craftsmanship but have limited access to professional design support, technological innovation and market-oriented product development. The absence of structured collaboration with design institutions has constrained creativity and restricted product diversification.
5. The research identified that dependence on middlemen, fluctuating raw material prices, and inadequate direct market access continues to reduce the profitability of artisans in both clusters. Strengthening digital marketing platforms, producer cooperatives and direct-to-consumer sales channels would significantly improve artisans' income and market competitiveness.
6. The study found that despite the cultural, historical, and ecological significance of handcrafted bell metal products, branding and promotion remain inadequate. The limited utilization of Geographical Indication (GI), product certification and heritage branding has reduced the national and international visibility of the Sarthebari and Hajo bell metal industries.
7. The analysis demonstrated that integrating modern design principles with traditional craftsmanship can improve product quality, functionality, and aesthetic appeal without compromising the authenticity of indigenous manufacturing techniques. Such integration would enable artisans to compete more effectively in premium domestic and global handicraft markets.

8. The research highlighted that sustainable enterprise development requires diversification from traditional household utensils toward high-value products such as luxury interior décor, architectural fittings, decorative lighting, corporate gifts, designer kitchenware and cultural souvenirs. This diversification would create new employment opportunities while enhancing the economic resilience of artisan communities.
9. The study emphasized that institutional interventions involving the Government of Assam, the Ministry of Textiles, the North Eastern Handicrafts and Handlooms Development Corporation (NEHHDC), the National Institute of Design (NID) and the National Institute of Fashion Technology (NIFT) are essential for strengthening design innovation, entrepreneurship, skill development, technology transfer and market linkage in the Sarthebari and Hajo clusters.
10. The study concludes that product adaptation is the most effective strategy for transforming the traditional bell metal handicraft clusters of Sarthebari and Hajo into sustainable, innovation-driven, and globally competitive creative enterprises. Such transformation would simultaneously preserve Assam's rich cultural heritage, strengthen rural livelihoods, generate employment, promote cultural tourism and contribute significantly to the state's sustainable economic development.

Conclusion

The present study concludes that the traditional bell metal handicraft clusters of Sarthebari and Hajo continue to represent two of Assam's most significant centres of indigenous metallurgical heritage, preserving centuries-old artisanal knowledge, cultural identity, and traditional craftsmanship. However, the findings reveal that the long-term sustainability of these clusters is increasingly challenged by changing consumer preferences, limited product diversification, rising production costs, dependence on traditional marketing channels, and intense competition from inexpensive machine-manufactured metal products. These structural constraints have reduced market competitiveness and discouraged younger generations from entering the craft sector, thereby posing a serious threat to the continuity of this valuable intangible cultural heritage (Scrase, 2003).

The study further establishes that product adaptation offers the most effective pathway for revitalizing the traditional bell metal industry without compromising its cultural authenticity. Integrating innovative design, ergonomic improvements, contemporary aesthetics, and functional diversification into traditional manufacturing practices can significantly enhance consumer acceptance, expand domestic and international market opportunities, and improve the economic resilience of artisan households. The development of modern product lines including premium tableware, architectural accessories, designer home décor, hospitality products, and corporate gifting solutions can generate higher value addition while preserving the distinctive characteristics of the traditional copper–tin alloy (Chattopadhyay, 2018).

The research also highlights that sustainable enterprise development cannot be achieved solely through production enhancement but requires comprehensive institutional support. Strengthening the implementation of the Geographical Indication (GI) framework, expanding digital marketing capabilities, facilitating direct market access, establishing raw material banks, promoting design incubation, and encouraging collaboration among artisan cooperatives, government agencies, design institutions and private enterprises are essential for improving the competitiveness of the Sarthebari and Hajo clusters (Ministry of Textiles, 2024)

In conclusion, the future of Assam's bell metal handicraft industry depends on successfully balancing heritage conservation with innovation-led enterprise development. By adopting market-oriented product adaptation strategies while safeguarding traditional craftsmanship, the bell metal clusters of Sarthebari and Hajo can evolve from predominantly survival-based cottage industries into globally recognized creative enterprises. Such a transformation will not only preserve Assam's rich cultural legacy but also strengthen rural livelihoods, create sustainable employment opportunities, promote cultural tourism, and contribute meaningfully to inclusive and sustainable economic development in the state (Bhuyan & Saikia, 2025).

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