

From Raw Material to End Consumer: Supply Chain Challenges and Strategies for Building a Resilient Indian Handicraft Sector

Rajesh Kumar Choudhary^{1*} and Dr. Saroj Kumar Mishra²

¹ Department of Management Studies, Rajiv Gandhi Institute of Petroleum Technology, Jais, Amethi, Uttar Pradesh, India; Assistant Professor, NIFT Patna

² Department of Management Studies, Rajiv Gandhi Institute of Petroleum Technology, Jais, Amethi, Uttar Pradesh, India

Corresponding author: Rajesh Kumar Choudhary | Email: pm1908@rgipt.ac.in

ORCID: Rajesh Kumar Choudhary: 0000-0003-2941-1252; Saroj Kumar Mishra: 0000-0002-4081-8144

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The Indian handicraft sector connects cultural heritage with rural employment, entrepreneurship and creative economic activity. Yet its supply chains are fragmented, decentralized and often informal. Challenges arise across the entire chain, including irregular raw-material availability, limited working capital, dispersed production, inconsistent quality, information asymmetry, dependence on intermediaries, weak logistics, limited digital integration and restricted consumer access. This conceptual article synthesizes literature on handicraft value chains, supply-chain management, digital adoption and sustainability to examine these interconnected constraints. It proposes an Artisan Integrated Supply Chain Framework (AISCF) that coordinates material, information, financial, knowledge and feedback flows from suppliers to consumers. The framework emphasizes collective procurement, cluster-level capacity planning, common quality and packaging systems, digital order and inventory visibility, transparent value-adding intermediation, consolidated logistics, traceability and omnichannel distribution. The article argues that supply-chain modernization should strengthen rather than displace the cultural identity and livelihoods of artisans. Coordinated action by artisans, producer organizations, intermediaries, retailers, digital platforms and policymakers can improve resilience, market responsiveness and fair value capture.

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. Introduction

Handicrafts differ from mass-produced goods because their value combines human skill, traditional techniques, local materials and place-

based cultural identity. The Indian sector is predominantly decentralized and labour-intensive, with production often organized through household and cottage-based units

(Datta & Bhattacharyya, 2016; Yadav et al., 2021). This structure supports livelihoods and preserves specialist skills, but makes coordination more difficult as buyers increasingly expect reliable quality, timely delivery, competitive prices, digital availability and transparent product information.

Supply-chain management concerns the coordinated movement of products, information and related activities from sourcing to final consumption (Mentzer et al., 2001; Seuring & Müller, 2008). Therefore, handicraft supply-chain challenges cannot be reduced to transport or marketing alone. They begin with raw materials and finance, and extend through production, aggregation, inventory, quality assurance, packaging, distribution, retail, e-commerce and after-sales feedback. Prior studies identify material constraints, intermediary dependence, weak market access, limited technology adoption and insufficient institutional support (Panda, 2009; Khan & Amir, 2013; Singh et al., 2018; Dalal et al., 2023).

Digital channels offer new opportunities, but listing products online does not resolve production, fulfilment, trust or logistics problems. E-commerce adoption is affected by technological, organizational and strategic conditions (Yadav & Mahara, 2018), while skills, infrastructure, cost and legal barriers can limit adoption (Dwivedi & Pradhan, 2024). The central argument is that handicraft competitiveness depends on the effectiveness of the complete supply chain connecting raw materials, artisans, intermediaries, markets and consumers.

2. Problem, Objectives and Research Questions

The fundamental problem is the mismatch between dispersed, small-scale production and the coordination requirements of modern markets. A typical chain may run from raw-material supplier to local trader, artisan or household, master craftsperson, aggregator, wholesaler, retailer and consumer. Multiple hand-offs can increase transaction costs, obscure demand and margins, weaken bargaining power, create irregular schedules and reduce the value captured by artisans. The problem is systemic

because physical, financial and information constraints reinforce one another.

The article aims to: (i) examine supply-chain challenges from raw-material procurement to the end consumer; (ii) synthesize relevant literature; (iii) identify operational, financial, technological, logistical and market bottlenecks; (iv) develop an integrated framework; and (v) propose managerial and policy interventions.

The guiding questions are: What are the main end-to-end supply-chain challenges? How does fragmentation affect productivity, profitability and market access? How can digital technologies integrate the chain? How can quality, logistics and information sharing improve without undermining authenticity? What interventions can create a resilient and sustainable artisan supply chain?

3. Methodological Approach and Conceptual Foundation

This article uses an integrative conceptual literature-review approach and does not claim to report new primary data. The reviewed material is organized around five connected stages: upstream sourcing and finance; artisan production and quality; aggregation, inventory and information; downstream logistics, retail and e-commerce; and consumer trust, authenticity and feedback. The conceptual foundation draws on value-chain analysis (Porter, 1985), supply-chain integration (Lambert & Cooper, 2000; Mentzer et al., 2001), responsive and adaptable supply chains (Fisher, 1997; Lee, 2004), resilience (Christopher & Peck, 2004; Ponomarov & Holcomb, 2009) and sustainable supply-chain management (Carter & Rogers, 2008; Seuring & Müller, 2008).

4. End-to-End Supply-Chain Challenges

4.1 Raw-material sourcing and working capital

Handicraft clusters use specialized materials such as wood, bamboo, cane, metal, stone, clay, yarn, silk, cotton, natural fibres, dyes, leather and beads. Supply may be seasonal, geographically concentrated or affected by price and processing

constraints. Evidence from Odisha stone-carving clusters highlights irregular availability, cost and seasonality as barriers to production continuity (Panda, 2009). Artisans may delay orders, substitute materials, reduce output or absorb cost increases. Collective procurement, diversified suppliers, cluster-level material banks and responsible sourcing can reduce exposure.

Finance is closely connected to procurement and delivery. Artisans often pay for materials and labour before receiving payment from buyers. Where formal credit is limited, advances from intermediaries may create dependency and weaken bargaining power (Khan & Amir, 2013). Purchase-order finance, invoice finance, cooperative credit, digital payments and revolving working-capital facilities could improve continuity and autonomy.

4.2 Fragmented production, capacity and quality

A product may pass through several specialist households for material preparation, embroidery, finishing and packaging. Without shared schedules and clear responsibilities, coordination problems arise in capacity, lead time, design changes, communication and order tracking. Informal capacity estimates can result in overcommitment, late delivery, excessive overtime, quality deterioration and cancelled orders. Cluster-level capacity mapping, artisan allocation, realistic lead times and basic production records can synchronize demand and supply. Evidence from distributed handmade-rug supply chains suggests that systematic supervision can improve artisan productivity (Singhvi et al., 2025).

Quality management must distinguish authentic handmade variation from defects. Minor differences in embroidery may signal craftsmanship, whereas broken parts, poor finishing, unsafe materials, incorrect dimensions and inadequate packaging can undermine buyer confidence. Cluster systems should define product specifications, acceptable tolerances, material and finishing standards, inspection procedures, grading and return handling without

forcing crafts into inappropriate mass-production uniformity.

4.3 Intermediaries and information asymmetry

Intermediaries can provide finance, materials, aggregation, transport, design support, quality control and market access. The problem is not their existence but opaque or excessive intermediation that limits artisans' visibility into consumer demand, retail prices and margins. The objective should be to move from opaque intermediation to value-adding intermediation, with transparent roles and fairer terms.

Information should flow in both directions. Retailers and consumers need accurate information on artisan capacity, lead times and product origin; artisans need timely information on trends, colours, prices, returns, customer preferences and future orders. Better information sharing can reduce mismatches between unpopular inventory and shortages of products in demand. A demand-informed process—market signal, forecast, small-batch production, test sale and then scale-up—is more responsive than producing first and searching for buyers later (Fisher, 1997; Lee, 2004).

4.4 Inventory, logistics and packaging

Poor demand visibility can cause excess seasonal stock, damaged goods, fashion obsolescence, storage problems and shortages of fast-selling products. Basic stock records, product-level identification and small-batch planning can improve visibility and reduce working-capital pressure. Remote cluster locations, small consignments, irregular pickups, long lead times and limited reverse logistics also raise per-unit costs. Fragile pottery, glass, stone, wood and metal items are especially vulnerable to damage.

Cluster logistics centres can consolidate shipments, coordinate pickups and improve tracking. Packaging should be treated as a supply-chain function as well as a branding activity. Product-specific protection, suitable cartons, moisture resistance, labelling, QR or barcode identification and clear return instructions can

reduce breakage, returns and negative reviews, particularly in e-commerce.

4.5 Digital commerce, traceability and consumer feedback

E-commerce can expand market access, but a functional digital supply chain requires more than a product listing. It links catalogues, inventory, order management, artisan allocation, production tracking, inspection, packaging, delivery, payment settlement and customer service. Digital adoption depends on skills, infrastructure, trust, affordability and organizational readiness (Yadav & Mahara, 2018; Dwivedi & Pradhan, 2024). Social-media marketing can improve awareness and purchase intention, but it should be supported by reliable fulfilment and service (Guha et al., 2021).

Consumer reviews, complaints, returns and browsing or sales patterns provide feedback for design, quality and production decisions. Geographical Indications (GIs) can support place-based identity, but a GI label alone does not ensure supply-chain efficiency or prevent counterfeiting. Traceability tools, including QR-enabled product records, can communicate artisan or cluster identity, geographical origin, craft history, materials, production methods, authenticity and care information. Such tools can strengthen trust when the information is accurate and verifiable.

4.6 Sustainability and artisan well-being

Handmade production should not automatically be assumed sustainable. Economic sustainability requires adequate artisan income; social sustainability includes dignified livelihoods, safe work and transmission of skills; environmental sustainability concerns materials, energy, chemicals, packaging and transport. Sustainable supply-chain management integrates economic, social and environmental considerations (Carter & Rogers, 2008; Seuring & Müller, 2008). Research on Dhokra and metalware artisans also highlights livelihood and occupational safety concerns (Dhingra et al., 2017; Deshmukh et al., 2024; Sahu & Pandit, 2024). Productivity initiatives should therefore be accompanied by

ergonomic tools, protective equipment, safe working conditions, suitable hours and skills development.

5. Proposed Artisan Integrated Supply Chain Framework (AISCF)

The AISCF treats the handicraft supply chain as a coordinated network rather than a linear sequence of independent transactions. It integrates five flows: (1) material flow from suppliers to artisans and consumers; (2) information flow on orders, capacity, quality and demand; (3) financial flow through procurement, credit and payment; (4) knowledge and skill flow through training, design and craft transmission; and (5) value and feedback flow from consumers back to producers.

The framework is operationalized through a 6C strategy:

Collective procurement: cooperatives, self-help groups, producer companies or cluster purchasing groups pool demand, diversify suppliers and reduce input costs.

Capacity coordination: map artisan skills and output, allocate orders realistically and share production schedules and delivery commitments.

Common quality standards: establish product specifications, acceptable handmade variation, inspection, grading and protective packaging.

Connected digital platform: provide accessible tools for catalogues, orders, inventory, payments, production updates, market information and customer feedback.

Consolidated logistics: coordinate cluster pickups, packaging, warehousing, shipment tracking and returns.

Consumer connectivity: use retailer data, reviews, direct-to-consumer channels, storytelling and traceability to connect demand and production.

6. Managerial and Policy Implications

6.1 Artisans and producer organizations

Artisans can improve participation in the wider chain by maintaining basic costing and production records, documenting specifications,

using digital payments, joining collective procurement and learning about consumer preferences. Cooperatives and producer organizations can serve as supply-chain integrators, coordinating procurement, finance, quality, inventory, logistics, digital cataloguing, training and market intelligence—not merely sales.

6.2 Exporters, retailers and digital platforms

Exporters should build longer-term relationships with clusters and provide design support, realistic forecasts, capacity planning, quality training, fair payment schedules and order tracking. Retailers should share useful demand information rather than only issuing repeat orders. E-commerce platforms should combine product photography and digital storytelling with stock visibility, payment settlement, consolidated fulfilment, returns and demand analytics.

6.3 Policymakers and institutions

Policy should support shared facilities for material storage, tools, testing, packaging, warehousing, photography, cataloguing and logistics. Digital literacy programmes should cover actual tasks such as managing orders, inventory, QR codes, payments, customer reviews and fraud prevention. Cluster pickup systems can lower logistics costs. GI initiatives should be linked to credible traceability and consumer education. Financial institutions can consider purchase orders, confirmed demand and cluster production when designing suitable credit products. Institutional procurement channels can widen access, but must be matched by production, quality and fulfilment capability.

7. Theoretical Contribution and Propositions

The article extends a conventional value-chain view by examining handicrafts end to end, from raw-material supply to consumer feedback. It integrates value-chain analysis, supply-chain integration and sustainable supply-chain management, and emphasizes that both tangible products and intangible cultural knowledge move through the network.

The framework yields ten propositions for future empirical testing:

P1: Raw-material availability positively influences production continuity.

P2: Collective procurement capability positively influences artisan profitability.

P3: Production coordination positively influences supply-chain reliability.

P4: Quality-management capability positively influences buyer satisfaction.

P5: Information sharing positively influences demand responsiveness.

P6: Digital supply-chain integration positively influences market access.

P7: Logistics integration positively influences delivery performance.

P8: Traceability positively influences consumer trust.

P9: Sustainable supply-chain practices positively influence livelihood sustainability.

P10: Supply-chain integration positively influences handicraft enterprise competitiveness.

Future studies may test these relationships using PLS-SEM, regression, fsQCA or mixed methods across different craft clusters. Comparative work could examine Chikankari, Moradabad metalware, Saharanpur woodcraft, Jaipur block printing, Bhagalpur silk, Madhubani painting, Dhokra, Kashmir crafts and bamboo or cane clusters. A performance index could include cost, quality, speed, flexibility, reliability, digital integration, sustainability, artisan income and customer satisfaction. Further work could examine AI, blockchain, QR traceability, demand analytics and the relationship between supply-chain transparency, authenticity, trust, perceived value, purchase intention and advocacy.

8. Conclusion

The Indian handicraft sector's central challenge is not a lack of craftsmanship but weaknesses in the ecosystem that converts craftsmanship into commercially sustainable products. Constraints in materials and finance interact with fragmented

production, uneven quality, limited information, inventory and logistics problems, digital barriers and inadequate consumer feedback. Isolated interventions are unlikely to resolve these mutually reinforcing issues.

The AISCF proposes coordinated action across collective procurement, capacity planning, quality systems, digital integration, consolidated logistics

and consumer connectivity. The objective is not to industrialize handicrafts or eliminate every intermediary, but to improve transparency, reliability and fair value capture while preserving cultural identity. A resilient supply chain should benefit artisans through more dependable livelihoods and consumers through authentic, well-made products delivered reliably.

References

- Anand, S. (2026). Traditional craft and sustainable development: A study on Indian craft. *Social Responsibility Journal*, 22(4), 855–875. <https://doi.org/10.1108/SRJ-02-2025-0145>
- Basu, K. (1995). Marketing practices and handicraft enterprises in developing economies. [Use the verified bibliographic version when submitting; this source is frequently cited in Indian handicraft literature.]
- Beske, P. (2012). Dynamic capabilities and sustainable supply chain management. *International Journal of Physical Distribution & Logistics Management*, 42(4), 372–392.
- Beske, P., & Seuring, S. (2014). Putting sustainability into supply chain management. *Supply Chain Management: An International Journal*, 19(3), 322–331.
- Belli, S. M., & Rawat, A. (2023). Examining the challenges in the traditional artisan based supply chain: A qualitative diagnostic study. *Journal of Research Administration*, 5(2).
- Carter, C. R., & Easton, P. L. (2011). Sustainable supply chain management: Evolution and future directions. *International Journal of Physical Distribution & Logistics Management*, 41(1), 46–62.
- Carter, C. R., & Rogers, D. S. (2008). A framework of sustainable supply chain management: Moving toward new theory. *International Journal of Physical Distribution & Logistics Management*, 38(5), 360–387. <https://doi.org/10.1108/09600030810882816>
- Chaudhary, M., Agarwal, B., & Bhatia, M. (2022). Geographical indications in India: A case of handicraft industry in Uttar Pradesh. *The Journal of World Intellectual Property*, 25(3), 617–634. <https://doi.org/10.1111/jwip.12244>
- Chopra, S., & Meindl, P. (2019). *Supply Chain Management: Strategy, Planning, and Operation*. Pearson.
- Christopher, M. (2016). *Logistics & Supply Chain Management* (5th ed.). Pearson.
- Christopher, M., & Peck, H. (2004). Building the resilient supply chain. *The International Journal of Logistics Management*, 15(2), 1–14.
- Dalal, A., Bhattacharya, S., & Chattopadhyay, S. (2023). Ideating a framework for sustainable livelihood of handicraft producers at the bottom of the pyramid: A mix-method study from India. *Journal of Enterprising Communities: People and Places in the Global Economy*, 18(3), 701–723. <https://doi.org/10.1108/JEC-03-2023-0035>
- Datta, D. B., & Bhattacharyya, S. (2016). An analysis on problems and prospects of Indian handicraft sector. *Asian Journal of Management*, 7(1), 5–16. <https://doi.org/10.5958/2321-5763.2016.00002.0>
- Deshmukh, D., Sharma Rajput, C., Das, S., & Alam, M. M. (2024). Sustainability and livelihood of small-scale handicraft producers in India: A SWOT analysis of Dhokra artisans. *Social Sciences & Humanities Open*, 10, 101160. <https://doi.org/10.1016/j.ssaho.2024.101160>
- Dhingra, V., Mudgal, R. K., & Dhingra, M. (2017). Safe and healthy work environment: A study of artisans of Indian metalware handicraft industry. *Management and Labour Studies*, 42(2). <https://doi.org/10.1177/0258042X17714071>
- Dwivedi, S., & Pradhan, J. P. (2024). Analyzing legal and economic barriers faced by handicraft enterprises in e-commerce adoption: Evidence from Uttar Pradesh, India. *Arab Economic and Business Journal*, 16(1). <https://doi.org/10.38039/2214-4625.1038>
- Fisher, M. L. (1997). What is the right supply chain for your product? *Harvard Business Review*, 75(2), 105–116.

- Garg, P., & Walia, A. (2019). Delineating problems faced by artisans of Rajasthan: A case of emic-etic-emic analysis of the customer perspective. *International Journal of Indian Culture and Business Management*, 18(1), 1–11. <https://doi.org/10.1504/IJICBM.2019.096929>
- Guha, S., Mandal, A., & Kujur, F. (2021). The social media marketing strategies and its implementation in promoting handicrafts products: A study with special reference to Eastern India. *Journal of Research in Marketing and Entrepreneurship*, 23(2), 339–364. <https://doi.org/10.1108/JRME-07-2020-0097>
- Ibrahim, M., & Ojha, J. K. (2025). Leveraging digital spaces for rural women artisans and handicraft enterprises in the desert of Rajasthan, India. *Journal of Heritage Management*, 9(2), 140–149. <https://doi.org/10.1177/24559296241305686>
- Kama Raju, T., & Santosh Ranganath, N. (2010). Marketing of handicrafts: A case study of brass items manufacturing units in Srikakulam District of Andhra Pradesh. *Indian Journal of Marketing*, 40(9), 48–54.
- Khan, W. A., & Amir, Z. (2013). Study of handicraft marketing strategies of artisans in Uttar Pradesh and its implications. *Research Journal of Management Sciences*, 2(2), 23–26.
- Lambert, D. M., & Cooper, M. C. (2000). Issues in supply chain management. *Industrial Marketing Management*, 29(1), 65–83.
- Lee, H. L. (2004). The Triple-A supply chain. *Harvard Business Review*, 82(10), 102–112.
- Mentzer, J. T., DeWitt, W., Keebler, J. S., Min, S., Nix, N. W., Smith, C. D., & Zacharia, Z. G. (2001). Defining supply chain management. *Journal of Business Logistics*, 22(2), 1–25.
- Mehra, A., Mathur, N., & Tripathi, V. (2019). Sahaj Crafts: The challenge of alleviating poverty in Western Rajasthan. *Emerald Emerging Markets Case Studies*, 9(1). <https://doi.org/10.1108/EEMCS-06-2018-0099>
- Panda, D. K. (2009). Raw materials constraints in the handicraft sectors: Experience from stone carving clusters of Orissa. *International Journal of Indian Culture and Business Management*, 2(5), 519–534. <https://doi.org/10.1504/IJICBM.2009.025278>
- Ponomarov, S. Y., & Holcomb, M. C. (2009). Understanding the concept of supply chain resilience. *The International Journal of Logistics Management*, 20(1), 124–143.
- Porter, M. E. (1985). *Competitive Advantage: Creating and Sustaining Superior Performance*. Free Press.
- Sahu, A., & Pandit, S. (2024). Identification of work-related injuries among Dhokra handicraft artisans influencing sustainable growth of bell metal handicraft industry: An unorganized sector of Chhattisgarh, India. *Human Factors and Ergonomics in Manufacturing & Service Industries*, 34(1), 40–52. <https://doi.org/10.1002/hfm.21011>
- Seuring, S., & Müller, M. (2008). From a literature review to a conceptual framework for sustainable supply chain management. *Journal of Cleaner Production*, 16(15), 1699–1710. <https://doi.org/10.1016/j.jclepro.2008.04.020>
- Singh, J., Srivastava, A., & Awasthi, M. K. (2018). Study of value chain of Indian textile handicrafts: A case of Lucknow Chikankari. *Prabandhan: Indian Journal of Management*, 11(5), 28–41. <https://doi.org/10.17010/pijom/2018/v11i5/123810>
- Singhvi, D., Singhvi, S., & Zhang, X. (2025). A data-driven approach to improve artisans' productivity in distributed supply chains. *Operations Research*, 74(1), 281–300. <https://doi.org/10.1287/opre.2024.1009>
- Touboulic, A., & Walker, H. (2015). Theories in sustainable supply chain management: A structured literature review. *International Journal of Operations & Production Management*, 35(4), 635–660.
- Yadav, R., & Mahara, T. (2018). Ecommerce adoption: An empirical investigation in wooden handicraft SMEs of Saharanpur, Uttar Pradesh. *Prabandhan: Indian Journal of Management*, 11(8), 20–33. <https://doi.org/10.17010/pijom/2018/v11i8/130642>
- Yadav, U. S., Tripathi, R., & Tripathi, M. A. (2021). Strategies for development of handicraft sector (small industries) in India. *Journal of Asian and African Studies*, 47(3). <https://doi.org/10.1177/09708464211037466>
- Yadav, U. S., Tripathi, R., Tripathi, M. A., Kumar, P., Ghosal, I., Kumar, A., Mandal, M., & Singh, A. (2023). Digital and innovative entrepreneurship in the Indian handicraft sector after the COVID-19 pandemic: Challenges and opportunities. *Journal of Innovation and Entrepreneurship*. <https://doi.org/10.1186/s13731-023-00337-5>

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- Yadav, U. S., Tripathi, R., Tripathi, M. A., & Kumar, P. (2023). Strategies for channelizing women artisans as entrepreneurs and marketing of handicraft products: An empirical study. *Indian Journal of Marketing*, 53(11), 58–75. <https://doi.org/10.17010/ijom/2023/v53/i11/173317>
- Yadav, U. S., Yadav, A. K., Ghosal, I., Gupta, S., Kumar, A., Miglaani, N. S., Saroj, S., & Kumar, A. (2026). Evaluating the determinants of ESG practices in the handicraft industry with the mediating role of green entrepreneurial leadership and the moderating effect of technological innovation. *Discover Sustainability*, 7, 1091. <https://doi.org/10.1007/s43621-026-03388-2>