Received: 20 APR 2026 | Accepted: 22 JUN 2026 | Published Online: OCT 2026
UCLM Journal of Business, Accounting and Management Vol. 1 Issue 1 (October 2026)
DOI: https://doi.org/10.5281/zenodo.23469602

Bamboo Raw Material Scarcity and the Sustainability of Home-Based Bamboo Furniture Livelihoods in Mandaue City, Cebu A Phenomenological Study

Christine Jay C. Collados[1], Arien B. Maglasang[2], Neslyne Grace O. Mamporte[3], Sheena Mae L. Monterroyo[4], Jamaica M. Oroyan[5], Kingie G. Micabalo[6]*

[7]kmicabalo@uc.edu.ph
https://orcid.org/0000-0003-4179-2086
University of Cebu Lapu-lapu and Mandaue

*Correspondence

ABSTRACT

Bamboo furniture provides a livelihood for home-based artisans in Mandaue City, Cebu, yet participants in the present study described recurring difficulties in obtaining sufficient bamboo raw materials. This study explored the lived experiences of home-based bamboo furniture artisans regarding livelihood sustainability, client retention, customer satisfaction, the operational and financial challenges associated with raw material scarcity, and the strategies used to mitigate these challenges. A qualitative phenomenological design was employed. Eight registered home-based bamboo furniture artisans from Canduman and Casili, Mandaue City, were purposively selected based on direct involvement in the livelihood, experience of bamboo scarcity, and at least three years of industry experience. Data were gathered through individual in-depth interviews using a researcher-made, content-validated interview guide and analyzed through thematic analysis. The findings indicate that material scarcity affects livelihood sustainability through supply-chain vulnerability, production interruptions, delayed orders, unstable income, and increased procurement expenses. Client retention and customer satisfaction were shaped by product quality, service reliability, pricing practices, and communication about delays. Artisans responded through inventory management, supplier diversification and alternative sourcing, credit arrangements, use of personal funds, pricing adjustments, and digital marketing practices. The findings suggest that livelihood continuity depends on the interaction of reliable resource access and the artisans' adaptive capacity. Strengthening supplier networks, inventory planning, financial resilience, customer communication, and community or institutional support may help reduce the effects of raw material scarcity.

Keywords: *Bamboo raw material scarcity; bamboo furniture; home-based livelihood; supply chain vulnerability; customer retention; qualitative phenomenology; Mandaue City*

INTRODUCTION

Bamboo is a versatile non-timber forest product used in furniture, handicrafts, construction, and other applications. The source study notes that its rapid growth and useful physical properties have contributed to its increasing use as an alternative to wood. At the local level, bamboo furniture production provides an income-generating activity for artisans who transform raw bamboo into functional and decorative products. The study, however, identifies raw material availability as a persistent concern for home-based bamboo furniture livelihoods in Mandaue City. The original research specifically focused on artisans operating in Canduman and Casili and examined how scarcity affects livelihood sustainability, production, expenses, pricing, income, client retention, and customer satisfaction. (DOST-FPRDI, 2024; Li & He, 2019).

The problem is not limited to the physical absence of bamboo. Participants described a chain of consequences: when nearby suppliers run out of stock, artisans may have to travel farther, incur additional transportation and incidental expenses, wait for deliveries, reduce or postpone production,

Copyright: ©2026 The Authors. UCLM Journal of Business, Accounting and Management is published by University of Cebu Lapu-Lapu & Mandaue
This is an open-access journal licensed under the Creative Commons Attribution-NonCommercial 4.0 International (**CC BY-NC 4.0**) License.

and renegotiate delivery schedules with customers. The source study also records that some orders are cancelled when agreed deadlines cannot be met. (PCARRD, 2020).

For small, home-based producers, these disruptions may have consequences beyond production efficiency. Reduced output can limit sales and income, while higher procurement costs can narrow margins. At the same time, artisans must preserve customer relationships by maintaining quality, communicating delays, adjusting prices, or accommodating customer preferences. Thus, raw material scarcity is experienced simultaneously as a supply-chain, financial, operational, and market challenge.

The study was guided by four questions: (1) How do artisans describe the status of their livelihood in terms of sustainability, client retention, and customer satisfaction? (2) What challenges associated with bamboo scarcity are experienced in production, expenses, pricing, and income? (3) What remedies are used to mitigate the effects of scarcity? and (4) What practical recommendations may be derived from the findings? These questions were retained from the original research problem.

The study contributes a localized account of resource scarcity from the perspective of artisans themselves. Rather than estimating the prevalence of scarcity across the entire bamboo sector, it seeks to understand how selected home-based artisans experience and respond to disruptions in their material supply.

METHODOLOGY

Research Design

The study employed a qualitative phenomenological design to explore the lived experiences of home-based bamboo furniture artisans facing bamboo raw material scarcity. The original study identifies phenomenology as its principal design and used individual interviews to obtain detailed accounts of participants' experiences.

Research Setting and Participants

The study was conducted in Canduman and Casili, Mandaue City, Cebu, areas identified in the source study as locations where home-based bamboo furniture activities are present. Eight artisans participated. Purposive sampling was used to select participants who could provide information directly relevant to the phenomenon. The inclusion criteria required participants to be active bamboo furniture artisans in Mandaue City, willing to participate in an in-depth interview, experiencing bamboo raw material scarcity, operating a registered home-based bamboo furniture livelihood, and having at least three years of experience as a bamboo furniture artisan.

Research Instrument

Data were collected using a researcher-made, open-ended interview guide covering livelihood sustainability, client retention, customer satisfaction, production, expenses, pricing, income, and coping strategies. The guide was aligned with the study domains and reviewed by a content expert for clarity, relevance, and structure.

Data Collection

Following institutional and local permissions, the researchers identified eligible participants, explained the study, and obtained informed consent. Individual interviews were conducted separately to facilitate in-depth discussion and minimize external influence. Follow-up questions were used when clarification was needed. Interviews were documented, transcribed, reviewed for completeness, coded, and organized into meanings and clustered themes.

Data Analysis

Thematic analysis was used to identify recurring patterns across the interview accounts. The process followed six broad stages reported in the source study: familiarization with the data, coding,

Copyright: ©2026 The Authors. UCLM Journal of Business, Accounting and Management

generation of themes, review of themes, definition and naming of themes, and preparation of the written findings.

Ethical Considerations and Trustworthiness

Participants provided informed consent and were informed of their right to withdraw. The researchers maintained confidentiality of participants' identities and sought to preserve the accuracy and integrity of the data. The source study also reports the use of content-expert review of the interview guide and triangulation involving primary interview data and secondary sources to support credibility and dependability.

RESULTS AND DISCUSSIONS

Livelihood Sustainability: Resource Dependence and Adaptive Capacity

The first major finding is that livelihood sustainability is strongly tied to reliable access to bamboo. Participants described situations in which shortages stopped or slowed production, caused missed delivery schedules, and reduced income. One participant explained that when bamboo supply is insufficient, customer orders are affected and some customers cancel. Another described the possibility of losses when materials do not arrive because production cannot proceed. The source study grouped these accounts under supply-chain vulnerability. (Christopher & Peck, 2004; Ivanov, 2020).

Participants also described maintaining stocks as a practical buffer against supply disruption. This indicates that inventory is not merely an administrative concern but a livelihood-protection mechanism. At the same time, artisans must balance stock availability with the risk of keeping too much unused bamboo, which may deteriorate. The resulting practice resembles adaptive inventory management: maintain enough material to support expected production while avoiding unnecessary accumulation.

A second dimension of livelihood sustainability was technological and marketing adaptation. Participants reported that mobile phones and online content creation made it easier to reach customers and promote their work. These practices broadened market visibility and provided an additional adaptive capacity when production constraints were present. The finding is consistent with the source study's discussion of Diffusion of Innovations and digital transformation, which links digital adoption with communication efficiency, customer engagement, and market reach.

Taken together, the findings indicate that livelihood sustainability is produced through an interaction between resource stability and adaptive capacity. Stable material access supports production continuity, while inventory planning and digital marketing provide mechanisms for coping with uncertainty. This interpretation is consistent with supply-chain resilience perspectives, in which flexibility, redundancy, and responsiveness help small enterprises absorb disruptions.

Client Retention: Quality, Reliability, and Relationships

Client retention emerged as a multidimensional outcome shaped by product quality, material availability, and customer relationships. Participants repeatedly emphasized craftsmanship and quality as reasons customers return. Conversely, poor workmanship may encourage customers to seek other suppliers. The source study therefore clustered these accounts under Product Quality and Satisfaction. (Aaker, 2014; Lemon & Verhoef, 2016).

Material scarcity, however, can undermine retention even when product quality remains high. Participants described losing customers when they could not fulfill orders because bamboo was unavailable. Delayed production creates uncertainty in delivery schedules and may cause customers to transfer their orders to other suppliers. This finding shows that quality alone cannot fully compensate for weak service reliability.

Copyright: ©2026 The Authors. UCLM Journal of Business, Accounting and Management

Communication emerged as an important mitigating mechanism. Participants reported explaining delays, accommodating customer preferences, and maintaining respectful relationships. Customization was also described as a way of encouraging repeat purchases. These practices suggest that customer retention is maintained not only through the physical quality of furniture but also through expectation management and relationship-building.

The findings correspond with the source study's use of customer relationship and communication as a clustered theme. In supply-constrained settings, transparent communication can reduce uncertainty and preserve trust, although it does not remove the underlying operational problem.

Customer Satisfaction: Managing Delays, Price, and Expectations

Customer satisfaction was closely associated with service reliability. Participants reported that bamboo shortages could prevent them from meeting agreed deadlines, resulting in cancellations or customers seeking alternative suppliers. The findings therefore identify service reliability and retention risks as a central theme. (Lemon & Verhoef, 2016).

Participants also described compensatory practices. In some situations, artisans lowered prices to encourage customers to continue with an order despite delays. In other situations, artisans emphasized workmanship and quality to maintain perceived value. These practices reveal a tension between customer satisfaction and financial sustainability: measures that preserve a customer relationship may reduce the artisan's margin.

Communication and expectation management provided another response. Participants described explaining shortages and price changes to customers. This suggests that satisfaction in this setting is not determined solely by delivery speed or price. It is also influenced by whether customers understand the circumstances affecting production and whether artisans remain responsive and transparent.

Production Challenges: Supply, Logistics, and Financial Constraints

Production disruptions were associated with three interrelated conditions: supplier depletion, logistical constraints, and limited cash flow. Participants reported that local suppliers sometimes had no bamboo available, requiring artisans to search elsewhere. Delays could also occur when transportation depended on drivers or when weather and distance affected procurement. The source study grouped these experiences under Resource Scarcity and Schedule Vulnerability, Supplier Depletion and Logistic Constraints, and Financial Resilience and Social Capital. (Christopher & Peck, 2004).

The production problem therefore extends beyond the workshop. When suppliers themselves are depleted, artisans cannot simply accelerate production. They must wait, search farther, or identify alternative sources. Limited cash flow adds another constraint because immediate purchases may not be possible. One participant reported relying on credit arrangements to obtain bamboo when funds were insufficient. This reflects the role of social capital in maintaining continuity during resource shortages.

From a supply-chain risk management perspective, the findings illustrate the vulnerability associated with dependence on limited supply options. Supplier redundancy and contingency sourcing can reduce exposure to a single supplier's stockout, while stronger inventory planning can create a buffer between procurement disruption and production interruption.

Expense Challenges: The Cost of Distance

The scarcity of nearby bamboo increased procurement-related expenses. Participants described traveling to distant suppliers and incurring transportation and fuel costs, as well as incidental expenses such as meals for people involved in sourcing. The source study characterized this as Increased Logistics and Travel Expense, with extended supplier distance and higher transportation costs forming the central components. (Abid et al., 2024; Sutoni et al., 2021).

The findings suggest that scarcity creates a 'distance cost' that is not reflected in the purchase price of bamboo alone. When artisans travel farther to obtain materials, the effective cost of inputs

Copyright: ©2026 The Authors. UCLM Journal of Business, Accounting and Management

increases because fuel, transportation, time, and incidental expenses are added to procurement. For home-based businesses with limited financial buffers, these additional expenses can reduce the resources available for labor, reinvestment, and other operating needs.

This finding is consistent with the source study's discussion of transportation costs and logistics as important determinants of cost efficiency under resource constraints. It also helps explain why material scarcity can affect income even when customer demand remains present: the business may continue receiving orders while simultaneously facing higher costs to fulfill them.

Pricing Challenges: Flexibility, Fairness, and Customer Sensitivity

Participants described pricing as flexible rather than fixed. Prices varied according to customer requirements, design complexity, customization, urgency, material availability, and the need to maintain a workable margin. The source study identified Price Estimation Practices, Price Control, and Customer Sensitivity as clustered themes under Customer-Centric Pricing Strategies. (Kotler & Keller, 2016; Lin et al., 2022).

The accounts reveal a balancing process. Artisans try to recover costs while avoiding prices that customers may consider excessive. Some participants negotiated with customers or explained why prices changed. Others deliberately avoided large increases to protect customer relationships. Thus, pricing functions simultaneously as a financial decision and a relationship-management strategy.

From a managerial accounting perspective, these findings point to the importance of understanding cost behavior and contribution margins when material prices fluctuate. Without adequate cost monitoring, customer-oriented price concessions may protect short-term sales while weakening the financial capacity needed for future procurement. The source study accordingly interpreted pricing decisions through Cost-Volume-Profit considerations.

Income Challenges: Reduced Output and a Reinforcing Cycle

Income was directly affected by limited material availability. Participants reported producing fewer furniture items when bamboo was scarce, declining some customer orders, and experiencing reduced earnings. The source study clustered these accounts under Reduced Income Due to Limited Supply and Sales. (Penrose, 2009).

A particularly important pattern is the reinforcing cycle between supply and income. When materials are scarce, production declines; when production declines, sales and income decline; when income declines, less money is available for purchasing and stocking bamboo; and limited reinvestment can further restrict production. This cycle places home-based artisans in a financially vulnerable position.

The findings are consistent with a Resource-Based View interpretation: access to a critical productive resource influences the capacity to create output and generate income. In this setting, bamboo is not readily replaceable for artisans whose products and skills are built around the material. Limited access therefore affects both operational capacity and competitive continuity.

Coping Strategies: Inventory, Supplier Diversification, and Financial Adaptation

Three broad coping strategies emerged: inventory management, supplier diversification and alternative sourcing, and financial coping strategies. Participants described maintaining stocks of bamboo while avoiding excessive accumulation, seeking distant or alternative suppliers when local sources were depleted, and using credit, down payments, alternative income, or personal funds when immediate financing was insufficient. The source study identifies these three strategies as the principal remedies used by artisans. (Christopher & Peck, 2004; Helfat et al., 2007).

Inventory management provides a first line of protection by creating a buffer against temporary shortages. Supplier diversification provides redundancy and reduces dependence on one source. Financial coping strategies provide short-term liquidity when procurement needs arise before sales

Copyright: ©2026 The Authors. UCLM Journal of Business, Accounting and Management

proceeds are available. These strategies demonstrate adaptive capacity, but they also indicate that much of the burden of managing scarcity rests on individual artisans.

The findings can be interpreted through Supply Chain Risk Management and Dynamic Capabilities. Supplier diversification represents redundancy and contingency planning, while financial and operational adjustments represent the capacity to reconfigure available resources under changing conditions. The strategies do not eliminate scarcity; rather, they help artisans continue operating despite it.

Table 1. Synthesis of Major Themes and Implications

Domain	Major Theme	Key Implication
Livelihood sustainability	Supply-chain vulnerability and digital/marketing adaptation	Continuity depends on reliable materials and adaptive market practices.
Client retention	Product quality; material availability; customer relationships	Quality and communication can support loyalty, but supply disruptions threaten retention.
Customer satisfaction	Service reliability; compensatory pricing and quality; expectation management	Delays and scarcity require transparent communication and careful service recovery.
Production	Supplier depletion, logistics, and financial constraints	Scarcity disrupts workflow and increases dependence on alternative procurement.
Expense	Extended supplier distance and transportation costs	Sourcing farther increases the effective cost of bamboo.
Pricing	Flexible, customer-centered pricing	Artisans balance cost recovery, affordability, and customer retention.
Income	Reduced output and sales; pricing decisions to protect income	Scarcity can create a cycle of lower production, lower income, and weaker reinvestment.
Coping	Inventory management, supplier diversification, financial coping	Redundancy and adaptive resource management support continuity.

IMPLICATIONS

The lived experiences of eight home-based bamboo furniture artisans in Mandaue City show that bamboo raw material scarcity is a multidimensional livelihood challenge. It affects the continuity of production, procurement costs, pricing decisions, income generation, client retention, and customer satisfaction. The effects are interconnected: material shortages can delay production; delays can affect customer relationships and sales; reduced sales can limit the funds available for future material purchases; and higher sourcing costs can further reduce financial flexibility.

At the same time, the participants demonstrated substantial adaptive practices. Maintaining appropriate stocks, developing alternative supplier networks, using credit or personal funds when necessary, adjusting prices, communicating with customers, preserving product quality, and using digital platforms are ways artisans respond to uncertainty. These practices demonstrate that livelihood sustainability is shaped not only by the availability of bamboo but also by the capacity of artisans to adapt their operational, financial, and customer-management practices.

Because the study is qualitative and localized to eight purposively selected artisans in Canduman and Casili, its findings should be understood as context-specific experiential evidence rather than statistically generalizable estimates of the entire bamboo furniture industry. The study nevertheless provides a useful basis for interventions aimed at strengthening the resilience of home-based bamboo furniture livelihoods in Mandaue City.

Copyright: ©2026 The Authors. UCLM Journal of Business, Accounting and Management

PRACTICAL RECOMMENDATIONS

- Artisans should maintain primary and secondary supplier relationships so that production is not dependent on a single source.
- Artisans should establish a practical inventory policy that identifies minimum stock levels while considering bamboo deterioration and storage capacity.
- Artisans should document actual procurement, transportation, fuel, labor, and incidental costs and use these data when setting prices.
- A clear pre-order and down-payment arrangement may help reduce the financial exposure associated with purchasing materials before production.
- Artisans should communicate material shortages and revised delivery schedules to customers as early as possible and document agreed adjustments.
- Artisans may strengthen digital marketing through shared or individual business pages and visual portfolios to broaden market reach.
- Local government, community organizations, and relevant support institutions may explore assistance for transportation, supplier linkage, bamboo propagation, skills development, and cooperative or group-based purchasing.
- Future research should examine bamboo supply availability, procurement networks, cost structures, and the effectiveness of coping strategies using larger samples and, where appropriate, mixed-method or longitudinal designs.

Author Contributions

Author 1: Conceptualization, Methodology, **Author 2:** Data curation, Writing-Original draft preparation; **Author 3**: Investigation, Validation, **Author 4**: Visualization, Writing- Reviewing; **Author 5:** Supervision, Editing; **Author 6:** Writing- Reviewing, Supervision.

Funding

This research received no external funding.

Generative AI Statement

The authors used ChatGPT (Open AI) solely as a language-support tool to improve the clarity, coherence, and grammatical accuracy of the manuscript. All AI-assisted outputs were critically reviewed, revised, and validated by the authors to ensure the accuracy, integrity, and originality of the content. The authors accept full responsibility for the final version of the manuscript and its published content.

Ethical Considerations

Prior to the data gathering, ethical approval was obtained from the University of Cebu Academic Research Ethics Committee (UCAREC). The approved protocol ensured adherence to the principles of respect for persons, beneficence, justice, voluntary participation, informed consent, confidentiality, and anonymity, and compliance with the Data Privacy Act throughout the research process.

Declaration of Competing Interest

The authors declare that they have no competing financial, professional, or personal interests that could have influenced the conduct, findings, or publication of this study.

Data Availability

Data will be made available by the corresponding author on request.

Acknowledgments

The authors sincerely acknowledge the University of Cebu Lapu-Lapu and Mandaue (UCLM) for its unwavering support in completing this research. The guidance and institutional resources provided by the University Research Center greatly contributed to the successful conduct of the study.

Copyright: ©2026 The Authors. UCLM Journal of Business, Accounting and Management

Finally, the authors express their sincere appreciation to the peer reviewers and editors for their constructive comments and recommendations, which significantly improved the quality and scholarly merit of this manuscript.

REFERENCES

Aaker, D. A. (2014). Aaker on branding: 20 principles that drive success. Morgan James Publishing.

Abid, A. B., Kessentini, M., & Elomri, A. (2024). Incorporating transportation costs into the single- and multiple-item newsboy problems. Scientific Reports, 14(1), 13627.

Baryannis, G., Dani, S., & Antoniou, G. (2019). Predictive analytics and artificial intelligence in supply chain management: Review and implications for the future. Computers & Industrial Engineering, 137, 106024. https://doi.org/10.1016/j.cie.2019.106024

Christopher, M., & Peck, H. (2004). Building the resilient supply chain. The International Journal of Logistics Management, 15(2), 1–14. https://doi.org/10.1108/09574090410700275

Department of Science and Technology–Forest Products Research and Development Institute. (2024). Bamboo processing and development.

Duan, Z., Zu, Q., & Rao, F. (2024). Bamboo scrimber as a sustainable material for chairs: A property study based on the finite element method. Sustainability, 16(13), 5357. https://doi.org/10.3390/su16135357

Helfat, C. E., et al. (2007). Dynamic capabilities: Understanding strategic change in organizations. Blackwell Publishing.

Ivanov, D. (2020). Viable supply chain model: Integrating agility, resilience, and sustainability perspectives. Annals of Operations Research. https://doi.org/10.1007/s10479-020-03640-6

Li, W., & He, S. (2019). Research on the utilization and development of bamboo resources through problem analysis and assessment. IOP Conference Series: Earth and Environmental Science, 300(5), 052028. https://doi.org/10.1088/1755-1315/300/5/052028

Lin, T. T., et al. (2022). Analysis of the effects of perceived value, price sensitivity, word-of-mouth, and customer satisfaction on repurchase intentions of safety shoes under the consideration of sustainability. Sustainability, 14(24), 16546. https://doi.org/10.3390/su142416546

Lemon, K. N., & Verhoef, P. C. (2016). Understanding customer experience throughout the customer journey. Journal of Marketing, 80(6), 69–96. https://doi.org/10.1509/jm.15.0420

Penrose, E. T. (2009). The theory of the growth of the firm (4th ed.). Oxford University Press.

Rogers, E. M. (2016). Diffusion of innovations (5th ed.). Free Press.

Sutoni, A., Setyawan, A. D., & Rusmana, R. (2021). The effect of guidelines on reducing logistics costs. Uncertain Supply Chain Management, 9(3), 579–586.

Verhoef, P. C., et al. (2021). Digital transformation: A multidisciplinary reflection and research agenda. Journal of Business Research, 122, 889–901. https://doi.org/10.1016/j.jbusres.2019.09.022

Villarreal, C. (2024). Service recovery strategies in small-scale manufacturing: Balancing delays with quality. Journal of Business Resilience, 22(2), 112–130.

Copyright: ©2026 The Authors. UCLM Journal of Business, Accounting and Management