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Carving Culture: An Analytical Study of Bhedhaghat Marble Craft, Jabalpur, M.P

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Abstract

This study explores an innovative approach to upcycling marble waste from the Bhedhaghat craft cluster into contemporary jewellery through practice-based design and collaboration with local artisans. Fragments generated during traditional carving were collected, sorted, and assessed for their suitability in micro-scale jewellery production. Selected pieces were carved into miniature floral and leaf motifs using conventional hand tools, combining heritage techniques with modern design intent.

Components were assembled using thread-based joining techniques to create lightweight, flexible, and youth-oriented designs, addressing the outdated aesthetics of existing market products. Surface finishing with marble powder enhanced both the visual appeal and comfort, while resin-bonded ear posts ensured a secure and durable fit. Prototype evaluation confirmed structural integrity, aesthetic quality, and user comfort, validating the feasibility of transforming marble by-products into high-value fashion accessories.

The study highlights the potential of design-led innovation to reduce material waste, strengthen artisan livelihoods, and reposition Bhedhaghat marble craft in contemporary fashion markets. By integrating sustainability, cultural heritage, and modern design principles, this research offers a replicable model for converting traditional craft residues into commercially viable, socially impactful, and environmentally responsible jewellery. It demonstrates how heritage craftsmanship can meet contemporary fashion demands while promoting sustainable artisan-based production.

Keywords: Bhedhaghat marble craft, sustainable jewellery, practice-based design, artisan collaboration, contemporary fashion, material waste management

INTRODUCTION

The unique marble craft of Jabalpur, commonly known as Bhedhaghat Stone Craft, dates back centuries of tradition in Madhya Pradesh, where Bhedhaghat's soft white marble is transformed into various objects and sculptures. The magnificent soft marble is sourced from marble cliffs lining the Narmada River in Bhedhaghat, as shown in Fig. 01. This craft is an integral part of the local heritage of Bhedhaghat. The intricate marble craft was granted a Geographical Indication (GI) tag in 2023 for its stunning craftsmanship.

The ancient history of this art form expanded in the Kalachuri Dynasty in the 10th century. Firstly, the inspiration was drawn from the sculptures and architecture of the Chausath Yogini Temple in Bhedaghat. The artisans of Bhedhaghat continue to pass down the skills and traditions from one generation to another. The craft was done using hand tools like chisels and hammers for carving on the marble, as shown in Fig. 02. Firstly, the design is sketched on the marble and then carved the details and followed by polishing. The process requires immense patience and skills.

The main features of this craft offer designs of Hindu deities like Durga ji, Shiva ji, Ganesha ji as shown in Fig 03 and home décor pieces with floral motifs, nature as shown in Fig 04 as well as name initials as shown in Fig 05, and couple name as shown in Fig 06 décor pieces of contemporary and traditional design to cater for the market.

These art pieces can be seen on the stalls in Bhedhaghat, where artisans sell their hand-carved products and detailed creations.

Fig 01

Fig 02

Fig 03

Fig. 04

Fig. 05

Fig. 06

Literature Review

Geological Characteristics

Bhedaghat marble is dolomitic or calcite-rich, soft enough for detailed carving yet durable for sculptures (CIIIPR, 2021). The gorge exposes white, grey, and pink marble, ideal for hand chiselling and polishing (Wikipedia, 2025). Fine grain allows intricate designs and potential miniature applications like jewellery (IJNRD, 2025).

Historical and Cultural Context

Marble carving dates back to the Kalachuri dynasty (10th century CE), reflecting the rich heritage of temple sculpture (Oaklores, 2025). Artisans, traditionally Visvakarma caste, pass skills within families. The craft produces religious icons, decorative items, and household ornaments.

Craft Techniques and Products

Artisans select marble blocks, shape them with hammers and chisels, and refine details using smaller tools (CIIIPR, 2021). Products include statues, decorative items, and souvenirs. Polishing enhances natural colours and visual appeal.

Socio-Economic Significance

Marble craft supports local livelihoods and tourism, supplying souvenirs and decorative items (Moneycontrol, 2025). The GI tag ensures authenticity, enhances market visibility, and supports artisan income (Outlook Traveller, 2025).

Material Constraints and Environmental Concerns

Extraction is restricted due to environmental regulations and conservation policies (IJNRD, 2025). Reduced raw material affects production and income. Competition from mass-produced alternatives and UNESCO tentative heritage status requires balancing craft sustainability with environmental protection (UNESCO, 2025).

Research Gaps

Material Studies: Few studies exist on marble durability, weathering, and mechanical properties.

Socio-Economic Data: Quantitative analysis of artisans' demographics, income, and market trends is lacking.

Technique Documentation: Ethnographic studies on skill transmission and carving methods are limited.

Product Diversification: Literature focuses on sculptures; jewellery applications remain underexplored (CIIIPR, 2021; Oaklores, 2025).

Material Properties: Soft marble may be fragile for earrings, pendants, and rings; no published mechanical testing exists (IJNRD, 2025).

Miniature Carving Techniques: Proven methods exist for larger items, but miniature jewellery carving lacks standardisation

METHODOLOGY

Research Design

This study employed a practice-based design research methodology to investigate the feasibility of transforming waste marble fragments from Bhedaghat into contemporary jewellery suitable for younger consumers. The approach integrated field investigation, material experimentation, artisan collaboration, and iterative prototyping. By combining qualitative insights with hands-on making processes, the study aimed to bridge traditional marble-carving practices with present-day design requirements.

Site Visits and Material Identification

Waste marble fragments were systematically collected from local carving workshops where offcuts are routinely discarded after sculpture and souvenir production.
The fragments were segregated based on dimensional suitability, surface texture, fracture behaviour, and carving potential.
Only structurally stable, crack-free pieces were selected to ensure the durability and functional reliability of jewellery components.

Documentation of Existing Marble Jewellery Market

A field survey of Bhedhaghat's local markets was conducted to review existing marble jewellery offerings.
The analysis revealed that current products predominantly feature traditional motifs and limited design diversity, rendering them less attractive to contemporary users, as shown in Fig. 07.
This assessment established a design gap for lightweight, aesthetically refined, and trend-oriented marble jewellery.

Collaboration With Artisans

Sustained interaction with local marble artisans formed a crucial component of the methodology. Artisans provided expert guidance on the physical behaviour of marble at small scales, carving limitations, and the adaptability of traditional techniques for contemporary forms. Their experience informed decisions related to motif selection, carving depth, detailing, and handling procedures, as shown in Fig. 08. The collaborative process ensured that the jewellery pieces retained the authenticity of Bhedhaghat craft traditions while meeting modern design expectations.

Carving and Form Development

The selected marble fragments were processed using traditional hand tools such as miniature chisels, hammers, files, and hand drills, as shown in Fig. 09. Forms were developed into floral, leaf, and abstract geometric motifs, as shown in Fig. 10, that aligned with contemporary aesthetic trends. Each piece was shaped with careful attention to balance, thickness, structural strength, and comfort during wear. A step-by-step refinement process was employed, allowing adjustments based on material responses, artisan feedback, and design requirements.

Surface Refinement

Carved forms were polished using traditional marble-finishing techniques, including buffing with marble powder and soft cloth.
This process enhanced the natural shine, smooth texture, and visual purity of the stone.
Edges were refined to ensure comfortable and safe wear.

Assembly Using Thread-work

For the assembly phase, strong and flexible thread-work techniques were adopted to join the carved elements. This method differed from the heavier metal-linking practices commonly observed in Bhedhaghat's existing jewellery market. Thread-based assembly allowed for greater design versatility, reduced product weight, and provided a soft yet durable connection suitable for delicate motifs. The technique also contributed to a more contemporary visual appeal, resonating with youth-oriented preferences.

Integration of Market-Available Components

Commercially available jewellery components from the Bhedhaghat market—such as decorative beads, were selectively incorporated. This ensured local manufacturability while modernising outdated design elements. These components were used strategically to maintain the local identity of the craft ecosystem. This combination enabled the creation of designs that remained locally producible while achieving an updated aesthetic.

Integration of Ear Posts

To complete the jewellery pieces, ear posts were attached to the carved primary motifs using a lightweight, transparent resin adhesive. This method ensured a clean, secure bond without causing structural damage to the marble surface. The adhesive was applied in controlled quantities to maintain balance and alignment. Each finished component underwent a stability check to confirm the durability of the attachment, overall comfort, and suitability for extended wear. The integration of ear posts provided a refined, market-ready finish aligned with contemporary jewellery standards.

Fig. 11,12,13,14 shows the final product.

Fig.07

Fig. 08

Fig. 09

Fig. 10

Fig. 11

Fig. 12

Fig. 13

Fig. 14

Results and Analysis

A. Presentation of Findings

The experimental process demonstrated that marble waste fragments can be successfully transformed into lightweight, wearable jewellery. Carved micro-forms exhibited aesthetic clarity and retained the fine-grained texture characteristic of Bhedhaghat marble. Polishing enhanced visual appeal without compromising structural integrity. Prototypes were found to be comfortable, skin-safe, and stylistically aligned with contemporary preferences.

B. Data Analysis and Interpretation

Test Conducted	Procedure / Observation	Result / Interpretation
Structural Stability Test	Pieces were handled, lightly stressed, and dropped from a low height	Minor breakage observed in thinner fragments; thicker fragments remained intact, indicating variability in waste quality
Wearability Test	Prototypes worn for an extended duration	Lightweight and comfortable; suitable for daily wear
Joint Strength Test	Threaded and resin-bonded joints were manually stressed	Threads remained secure; resin bond moderately strong, but may require reinforcement for long-term use
Skin Compatibility Test	Components worn in direct contact with the skin	No irritation observed; marble material confirmed as skin-safe
Flexibility and Movement Test	Chains and dangling components tested for mobility	Good flexibility; thread-based assembly enhanced movement and reduced bulk

Discussion

A. Interpretation of Results

Findings demonstrate that Bhedhaghat marble waste possesses adequate density for micro-carving and can be repurposed into refined jewellery components. Although minor breakage occurred in thinner fragments, selected pieces showed strong structural stability suitable for carved motifs. The polishing technique produced a smooth finish, while thread-based assembly improved flexibility and reduced weight.

B. Comparison with Existing Literature

The outcomes are consistent with prior research indicating that Bhedhaghat marble is fine-grained, easily carve-able, and ideal for detailed craftsmanship. Existing literature primarily documents the use of marble for sculpture and souvenirs; this study expands its applicability by demonstrating successful adaptation to contemporary micro-jewellery. The research also addresses market gaps identified in previous observations, showing that innovative design and waste-utilisation strategies can enhance the appeal of traditional craft for younger audiences.

C. Implications and Significance

The study highlights a sustainable model for upcycling marble waste into value-added jewellery, contributing to reduced material wastage and supporting environmentally responsible craft practices. It introduces new income opportunities for artisans through diversified, trend-oriented product ranges. Designer–artisan collaboration is demonstrated as an effective approach to revitalizing traditional crafts while preserving authenticity. The findings reinforce the potential for integrating heritage materials into modern fashion markets.

D. Limitations

The research was constrained by a limited sample size of high-quality waste fragments, causing variability in structural stability. Manual carving requires skilled labor, potentially restricting scalability. Thread-based assembly may necessitate further long-term durability testing.

Conclusion

This study demonstrates that Bhedaghat marble waste can be effectively transformed into contemporary, lightweight, and aesthetically appealing jewellery through a systematic practice-based approach. The integration of sustainable material use, traditional carving skills, and modern design sensibilities supports the advancement of eco-friendly craft innovation. The results confirm the material's suitability for micro-carving and contemporary fashion applications, while highlighting opportunities for expansion in craft-based entrepreneurship and youth-oriented markets. Although limitations exist, particularly in material variability and scalability, the research lays a foundation for further exploration of waste-based craft value chains.

Contribution to the Field

- Established a sustainable approach to transforming marble waste into high-value jewellery.
- Demonstrated how designer–artisan collaboration can modernise traditional craft practices.
- Enhanced the market relevance of Bhedaghat craft by aligning products with contemporary and youth-centric aesthetics.
- Provided a model for integrating craft heritage with eco-friendly material innovation.

Recommendations for Future Research

- Examine alternative lightweight fastening techniques to improve long-term durability.
- Expand testing across diverse marble waste qualities to enhance reproducibility.

• Conduct consumer preference studies to evaluate market acceptance.

• Explore scalability for craft-based entrepreneurship and commercial production.

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