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Exploration of Indigenous Plant Resources For Sustainable Handicraft Development in Hilly Areas: A Study of Pauri Garhwal Region

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ABSTRACT

This study examines the role of indigenous plant resources in promoting sustainable handicraft development and explores the challenges and opportunities faced by artisans in the Pauri Garhwal region of Uttarakhand. A qualitative, cross-sectional descriptive research design was adopted to understand current practices, resource utilization, market conditions, and artisan experiences. Primary data were collected through 40 in-depth interviews conducted across three blocks—Paubo, Dugadda, and Thalisain—using purposive sampling. Artisans engaged in crafting products from locally available plant materials such as Pirul, Ringal, and Bhimal were selected. Findings reveal a high dependence on Bhimal, followed by Pirul and Ringal, due to their easy availability and low cost, supporting sustainable production. Artisans primarily produce household and decorative items, with production often driven by local demand. However, limited market access confines most sales to local areas, resulting in low profitability. Despite the availability of natural resources, artisans face significant challenges, including inadequate government support, weak market linkages, and limited marketing skills. The study highlights a critical gap between policy initiatives and their implementation and emphasizes the need for institutional support, skill development, and market expansion to enhance the sustainability and economic viability of indigenous handicrafts. Overall, this methodology enabled an in-depth understanding of how indigenous plant-based handicrafts function at the grassroots level and highlighted key areas where intervention is needed to support artisans and promote sustainable livelihoods.

Keywords: *Artisans, Bhimal, Handicraft, Indigenous Plants, Indian Knowledge System, Pirul, Ringaal, Uttarakhand*

1. INTRODUCTION

Handicrafts form an integral part of the nation's cultural heritage and economic framework, offering numerous social and economic benefits (Singh, 2022). Handicraft products are generally described as eco-friendly items created by hand or with simple handmade tools, using natural materials such as wood, clay, bamboo, jute, moonj, willow, banana leaves, monas plants, and various shrubs and forest-based resources typically reflecting artistic expression and traditional craftsmanship (Yadav et al., 2022; Sinha et al., 2024). Handicraft sector is widely dispersed across both urban and rural areas and is highly labour-intensive, particularly supporting vulnerable groups while generating substantial employment with relatively low investment (Singh, 2022). Although the handicraft sector is dispersed, decentralized, and often operates in isolated units, it remains a crucial part of the Indian economy by utilizing locally available, eco-friendly and sustainable resources in a labour-intensive, energy-efficient, and low-capital manner, thereby supporting livelihoods and encouraging local enterprise in rural and semi-urban areas. (Khanduri and Datta, 2021). Handicraft sector safeguard cultural traditions, shared heritage, and Indian knowledge system that has been transmitted across generations. (Maheshwari et al., 2025).

Handicraft artisans across India are facing multiple challenges such as low and unstable incomes, dependence on middlemen, lack of access to modern tools and markets, limited awareness of government schemes, shortage of working capital, and declining demand due to competition from machine-made goods, high transportation costs,

and limited industrial infrastructure, making it harder for artisans to sustain their livelihoods (Shah et al., 2018; Khanduri and Datta, 2021; Kumar, 2022; Mishra et al., 2022; Sapna et al., 2022; Pande, 2022; Semwal et al., 2025).

One practical and sustainable solution to these challenges lies in the use of indigenous plants as raw materials for handicraft production (Yadav et al., 2022; Bhattacharya et al., 2024; Bolake, 2025). Indigenous plants are species that naturally grow in a particular region, ecosystem, or habitat without human introduction, having evolved alongside local wildlife, which makes them essential for maintaining ecological balance and often more region-specific than broadly classified native plants. Indigenous plants can support the handicraft sector by offering locally available, eco-friendly materials that promote sustainable livelihoods, preserve traditional knowledge, and strengthen the rural economy. Local artisans have long relied on these plants not only as raw materials but also as part of their inherited knowledge systems, understanding which plants to use, how to process them, and how to convert them into useful and decorative items. This knowledge is not formally taught but is passed down through generations within communities, making it a living example of traditional ecological knowledge. When handicraft products are made using indigenous plants, they directly reflect the principles of ethnobotany within the Indian Knowledge System (IKS) (Jadhao, 2025). The Indian Knowledge System is a broad framework that preserves and promotes traditional wisdom developed by communities over generations, and one of its important components is Ethnobotany, which focuses on how people use plants in their daily lives for food, medicine, shelter, and craft-making. These practices demonstrate how communities sustainably utilize local biodiversity while maintaining cultural traditions and supporting livelihoods. In this sense, plant-based handicrafts are not just economic activities but are deeply rooted in IKS, as they combine environmental understanding, cultural heritage, and practical application of indigenous knowledge (Rawat et al., 2010; Bhattacharya et al., 2024; Bolake, 2025).

This study is limited Uttarakhand state for exploring indigenous plant resources for sustainable handicraft development. Studies (Kala, 2007; Maikhuri et al., 2019) show that Himalayan regions of Uttarakhand have higher ethnobotanical diversity compared to lowland regions, making Uttarakhand more resource-rich for plant-based crafts. Other states may have handicrafts, but they lack the same diversity of indigenous raw materials, limiting scope for innovation. Uttarakhand offers forest-based, wild, and non-timber plant resources, such as ringal (a dwarf Himalayan bamboo), pirul (pine needles), and bhimal fiber. These are ecologically unique, region-specific, and less industrialized. Traditional ecological knowledge in the Himalayas is eroding faster than in many other regions due to migration and modernization (Kala, 2013; Negi et al., 2018). In case of Uttarakhand, the handicraft sector has not received sufficient policy attention largely due to weak enforcement of regulations, leaving industries that rely on natural resources and traditional community knowledge thereby limiting the overall development of the hill regions (Khanduri and Datta, 2021).

Uttarakhand's rich biodiversity is closely intertwined with its cultural heritage, providing local artisans with sustainable, indigenous materials to create unique handicrafts. These natural resources are central to both daily rural life and the commercial craft market, offering eco-friendly alternatives to modern materials. In regions like Uttarakhand, the relationship is clearly visible in the use of indigenous plants such as Ringal (dwarf bamboo), Pirul (pine needles), and Bhimal (natural fibre) for creating handicraft products. These indigenous plants play a vital role in supporting traditional handicrafts, providing sustainable raw materials for artisans while preserving ecological balance. Uttarakhand is rich in naturally available resources such as ringaal (dwarf bamboo), bhimal fibre, and pirul (pine needles), which are easily accessible in forest and rural areas. Since these materials are locally available, artisans do not need to depend heavily on expensive external inputs, thereby reducing production costs and increasing profit margins. Moreover, the use of such natural resources aligns with eco-friendly practices, as

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these materials are biodegradable and require minimal processing or energy consumption.

Ringaal (Dwarf Bamboo – Chimonobambusa falcata) is one of the most important resources for hill artisans, especially in higher altitude regions. It is lightweight, flexible, and durable, making it ideal for crafting baskets, storage containers, mats, trays, and utility items used in daily life as well as decorative products for urban markets. Ringaal-based crafts are also gaining popularity in eco-friendly product segments.

Bhimal (Grewia optiva) is widely valued for its strong natural fibres extracted from the bark. Artisans use these fibres to produce ropes, mats, bags, and traditional utility items. Bhimal fibre is known for its strength and biodegradability, making it suitable for sustainable handicraft production and rural livelihood generation.

Pirul (Chir Pine needles – Pinus roxburghii) has emerged as an innovative raw material in recent years. Artisans collect fallen pine needles and convert them into decorative items such as baskets, lampshades, coasters, wall hangings, and gift articles. The use of Pirul not only provides income opportunities but also helps in reducing forest fire risks, as accumulated dry needles are highly flammable.

Figure 1: Handicraft product from Pirul

Figure 2: Handicraft product from Ringaal

Figure 3: Handicraft product from Ringaal

Figure 4: Handicraft product from Bhimal

Overall, these indigenous plants support the handicraft sector by offering locally available, eco-friendly materials that promote sustainable livelihoods, preserve traditional knowledge, and strengthen the rural economy of Uttarakhand.

2. REVIEW OF LITERATURE

Indian handicrafts are largely rural and women-driven industries (Singh and Singh, 2023). The handicraft sector is a skill-oriented industry that relies on creativity, insight, and craftsmanship rather than large capital investments, allowing artisans to generate livelihoods using their own talent and artistic abilities even without extensive infrastructure or resources (Shah et al., 2018). Artisans face many challenges in handicraft sector (Shah et al., 2018; Khanduri and Datta, 2021; Kumar, 2022; Mishra et al., 2022; Sapna et al., 2022; Pande, 2022; Semwal et al., 2025). Table 1 provide summary of such challenges faced by artisans.

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Table 1: Summary of challenges faced by handicraft artisans

Challenge	Explanation	Author
Low profit margins	This exists particularly at the rural level, as they depend on multiple intermediaries and distribution channels to reach broader markets; although these products often command high prices in premium markets, the primary creators receive only a small share of the overall profits.	Shah et al. (2018); Pande (2022)
Lack of financial literacy	Language barriers and limited educational attainment pose significant challenges, particularly for rural women artisans in Uttarakhand; many women aged 40 and above have only completed secondary education (Class 10 or 12) and often lack functional literacy in Hindi and English—the primary languages used in official documents and digital platforms—which restricts their ability to understand paperwork, navigate online portals, access government schemes, and complete registrations independently.	Sapna et al. (2022); Semwal et al. (2025)
Lack of unity and cooperation among themselves	Since artisans are widely scattered and often unwilling to work collectively under a common platform	Shah et al. (2018); Ramachandran and Chandramohan (2025)
Absence of a well-structured policy framework	lack of support from governing bodies and insufficient incentives during economic downturns	Khanduri and Datta (2021); Mishra et al. (2022)
Lack of Awareness	a large number of them remain unaware of government schemes and credit programs available for their support	Shah et al. (2018); Singh (2022)
Financial constraints	Most artisans reported that they are unable to invest in modern machinery and advanced technology	Pande (2022); Negi (2024)

3. METHODOLOGY

The objective of this study is to examine the role of indigenous plant resources for sustainable handicraft development and to understand the challenges and opportunities faced by artisans in Pauri Garhwal region of Uttarakhand. This study has used qualitative research with cross-sectional descriptive research design aiming to capture the current practices, resource use, market conditions, and issues faced by artisans. Primary qualitative data is collected through in-depth interviews method of data collection. In total 40 in-depth interviews comprising 10 artisans from Paubo block, 20 from Dugadda block, and 10 from Thalisain block were conducted in this study. The questions of interview were translated into Hindi language for the convenience of respondents. Each interview lasted for 30-45 minutes. The interviews were executed at their location. The study has used non-probability purposive sampling technique where the data was collected from 40 artisans. Respondents were the artisans who produced or make handicraft products using locally available plant-based materials such as Pirul, Ringal, and Bhimal in Pauri Garhwal region of Uttarakhand. The research was carried out in the Pauri Garhwal district, covering three blocks—Paubo, Dugadda, and Thalisain. These areas were selected due to their active engagement in plant-based handicraft activities and the availability of indigenous raw materials.

4. FINDINGS

The findings of the study, based on interviews with 40 artisans from Pauri Garhwal in Uttarakhand, highlight important trends related to raw material use, production patterns, market conditions, and challenges faced by handicraft artisans working with indigenous plants such as Pirul, Ringal, and Bhimal. A significant proportion of artisans (25 out of 40) primarily use Bhimal as their main raw material, followed by 10 artisans using Pirul and only 5 using Ringal, indicating a higher dependence on Bhimal-based fibre crafts. Regarding raw material sourcing, the majority of respondents stated that these indigenous plants are

locally available and can be collected at little or no cost, which reduces production expenses and supports sustainable practices.

In terms of product types, artisans mainly produce items used for household purposes and home decoration, such as baskets, mats, and decorative articles. Production is often demand-driven, with some artisans creating specific products based on customer requirements. Customer preferences were found to be largely oriented towards basic utility products, although decorative items gain popularity during festive or seasonal periods.

Most artisans sell their products in local markets due to limited access to wider markets. However, they expressed willingness to expand production if they receive demand from outside regions. Profitability remains a major concern, as most respondents reported low earnings from their work. They emphasized that with better institutional support, especially in generating demand, they would be able to improve their income and sustain their livelihoods. When asked about government initiatives, the majority of artisans felt that support from government agencies is either limited or not effectively reaching them, indicating a gap between policy formulation and implementation. The key challenges identified include lack of government support, low market demand, and insufficient marketing skills. These issues collectively restrict the growth of the handicraft sector and limit the economic potential of artisans.

Overall, the findings suggest that while the use of indigenous plants provides a strong foundation for sustainable and low-cost production, the sector requires improved market linkages, policy support, and skill development initiatives to enhance its viability and contribution to rural livelihoods.

5. CONCLUSION

For the development of handloom and handicrafts in Uttarakhand, artisans require consistent and structured support from the government to sustain their livelihoods, including better access to skill development programmes, modern tools and technology, and stronger market linkages at both national and international levels; they also need easier access to credit, subsidies, and insurance to ensure financial security, along with certification systems, local craft clusters, and design innovation centres. At the same time, it is important to preserve traditional crafts such as Aipan, Ringaal, and wool weaving while enhancing their economic viability so that artisans can achieve self-reliance and contribute more effectively to the region's cultural and craft-based economy. Utilizing indigenous plants also opens up opportunities for innovation and product diversification. Artisans can create a wide range of utility and decorative items such as baskets, mats, home décor products, bags, and eco-friendly lifestyle goods that have growing demand in urban and international markets. In addition, products made from natural materials are increasingly preferred by environmentally conscious consumers, giving artisans a competitive advantage. This approach also strengthens rural employment and women empowerment, as collection and processing of these materials can be carried out locally, often involving self-help groups and community participation. It further contributes to environmental conservation—for example, the use of pine needles (pirul) helps reduce forest fire risks in the region. However, to fully realize this potential, supportive measures are essential including financial literacy training, training in design and skill development, better market linkages, access to credit, branding and certification, and the establishment of local craft clusters. With the right institutional support, the use of indigenous plants can become a viable and sustainable solution, helping artisans achieve self-reliance while preserving traditional knowledge and promoting the cultural economy of Uttarakhand. The study was limited to a small sample size within selected blocks of Pauri Garhwal, which may not fully represent all artisans across Uttarakhand. Additionally, findings are based on self-reported data, which may include subjective biases.

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