Development of Integrated Ecoprint and Deer-Motif Batik Innovation to Strengthen Local Creative Economy in Cisaat Tourism Village, Subang

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ABSTRACT

This study discusses the development of integrated ecoprint and deer-motif batik innovation as a strategy to strengthen the local creative economy in Cisaat Tourism Village, Subang. The study aims to explore how sustainable textile innovation, participatory community empowerment, and tourism-based cultural identity can be integrated into the development of the local creative industry. The study employed a Participatory Action Research (PAR) approach involving female batik artisans from Komunitas Batik Sumbangsih, academics, and university students through collaborative workshops and practical training activities conducted in April 2026. The program consisted of ecoprint training, deer motif design workshops utilizing AI generative technology, batik stamp production, and integrated textile manufacturing processes. The results demonstrated increased community skills in sustainable textile production, creative motif development, and environmentally friendly batik innovation. The integration of deer motifs with ecoprint techniques produced unique cultural products reflecting the ecological and tourism identity of Cisaat Village. Furthermore, the initiative contributed to community empowerment, product diversification, tourism branding, and the enhancement of local entrepreneurial capacity. This study contributes to the discussion of sustainable development of the creative economy by presenting an integrative model that combines traditional batik craftsmanship, ecological innovation, participatory design, and community-based tourism in rural Indonesia.

Keywords: Artificial Intelligence, Community Empowerment, Cultural Heritage, Participatory Action Research, Sustainable Textile Innovation

INTRODUCTION

Cisaat Tourism Village in Subang Regency reflects the growing transformation of rural tourism destinations in Indonesia, integrating cultural preservation, natural resources, and community-based creative economies. The village possesses significant tourism assets, including agricultural landscapes, strawberry and pineapple plantations, livestock activities, and traditional cultural attractions that support sustainable tourism development. Previous studies have highlighted that Cisaat has been promoted as a tourism village because of its natural panorama, agro-tourism potential, and traditional cultural identity, which attract visitors seeking authentic rural experiences (Yunani et al., 2024). In addition, local empowerment programs in Cisaat have demonstrated the importance of strengthening community participation and tourism-based economic activities to improve village competitiveness.

The development of tourism villages increasingly emphasizes integrating creative industries with local identity and cultural resources. Creative tourism enables local communities to transform cultural expressions into

economic opportunities through participatory experiences and the innovation of local products (Bakas, 2025). In this context, batik production represents an important creative sector that can strengthen both tourism attractiveness and local identity. Batik innovation has evolved beyond traditional production into environmentally sustainable practices, including ecoprint techniques and contemporary motif development that respond to modern market preferences (Ariffin et al., 2024; Berutu et al., 2023). Such innovation is particularly relevant for tourism villages because creative products function not only as souvenirs but also as representations of local narratives and cultural heritage.

Cisaat also demonstrates strong potential for community-driven craft development. Existing empowerment programs in the village have involved local communities, MSMEs, and educational institutions in developing digital marketing, souvenir production, and tourism promotion activities. Community participation has been recognized as a critical factor in ensuring tourism sustainability and strengthening social cohesion within tourism villages (Lestari et al., 2025; Wibowo et al., 2026). Furthermore, local training activities related to textile crafts and souvenir production in Cisaat have shown that residents are enthusiastic and capable of adapting to the development of creative products based on local resources.

The integration of ecoprint techniques with the innovation of deer-motif batik offers a strategic opportunity to strengthen Cisaat's local creative economy. Ecoprint uses natural leaves and flowers, along with organic dyeing processes that align with sustainable tourism principles and environmentally friendly production systems. The ecoprint process itself involves natural mordanting, steaming, fixation, and leaf-pattern transfer techniques that create unique textile aesthetics. Simultaneously, deer motifs can symbolize local ecological identity and reinforce destination branding through distinctive visual storytelling. Similar studies found that heritage-based batik innovation contributes significantly to community-based tourism and local economic revitalization (Juliana et al., 2026). Therefore, integrating ecoprint and deer-motif batik can create competitive tourism products while preserving local cultural and environmental values.

Batik and ecoprint have emerged as important components of Indonesia's creative textile industry by combining cultural heritage, artistic expression, and sustainable innovation. Batik, recognized as an intangible cultural heritage, reflects regional identity through symbolic motifs, philosophical meanings, and traditional craftsmanship that continue to evolve in response to contemporary market trends (Urip et al., 2025). The development of batik motifs increasingly incorporates local narratives and destination identities, thereby enabling textile products to serve as cultural representations within tourism destinations. In the context of Cisaat Tourism Village, deer-motif batik innovation can function as a visual identity that strengthens local branding and differentiates the village from other tourism destinations.

The economic significance of batik extends beyond cultural preservation, as the industry contributes substantially to local employment, small-business growth, and tourism development. Batik-based SMEs create economic linkages between textile production, handicrafts, and tourism services, particularly in rural communities (Akhir et al., 2018; Suhud & Hidayat, 2015). Recent innovations in craft-based SMEs also demonstrate that sustainable product diversification and creative experimentation increase market competitiveness and consumer interest, especially among younger generations and cultural tourists (Harsanto et al., 2026). In Cisaat, local empowerment programs focused on souvenir production and creative skills training indicate that the community has strong potential to develop tourism-based textile products.

Ecoprint represents a sustainable textile innovation that utilizes leaves, flowers, and natural pigments to create environmentally friendly motifs and patterns. The ecoprint method reduces dependence on synthetic chemicals and supports sustainable production systems aligned with green tourism principles (Dobriyal & Sarkar, 2025). Studies on ecoprint development revealed that mordanting techniques, steaming processes, and natural dye fixation significantly influence product quality and durability (Rudianto et al., 2026). Furthermore, ecoprint training programs have contributed positively to rural socioeconomic empowerment by leveraging local natural resources and fostering community creativity (Diwanti & Susilawati, 2024). Similar community-based craft activities in Cisaat have successfully encouraged residents to develop souvenir products derived from local resources and textile creativity.

The integration of batik, ecoprint, and tourism-based textile innovation creates opportunities for the development of experiential and creative tourism. Textile workshops, storytelling activities, and participatory crafting experiences strengthen visitor engagement while preserving local traditions (Li & Shaw, 2022). Tourism destinations that integrate heritage-based textile innovation into community-based tourism have demonstrated stronger destination branding and cultural revitalization (Salsabila et al., 2025). Therefore, integrating ecoprint and deer-motif batik in Cisaat Tourism Village can strengthen the local creative economy while supporting sustainable tourism and cultural preservation.

The development of integrated ecoprint and deer-motif batik innovation in Cisaat Tourism Village aims to strengthen the local creative economy through sustainable cultural products and tourism-based entrepreneurship. This study focuses on promoting community empowerment, preserving local identity, and increasing tourism attractiveness through environmentally friendly textile innovation. Ecoprint batik, which utilizes natural resources, has demonstrated significant socioeconomic benefits for rural communities, particularly by increasing local productivity and creative participation (Diwanti & Susilawati, 2024). In Cisaat, the development of tourism villages, local handicrafts, and souvenir-based entrepreneurship has shown strong potential to support economic diversification and enhance community welfare.

Despite growing interest in creative tourism, existing studies still offer limited discussion of the integration of local textile crafts with tourism-based economic development. Previous research has mainly examined creative tourism from broader cultural and destination perspectives without specifically emphasizing localized batik innovation and motif identity (Pimenta et al., 2021). Moreover, studies on rural tourism development highlight the importance of community participation and local cultural assets. However, the utilization of ecoprint and environmentally sustainable batik production remains underexplored within tourism villages (Suriyankietkaew et al., 2025). In Cisaat, tourism potential has been identified through participatory village development and local empowerment initiatives, although innovative textile-based products remain limited.

The novelty of this article lies in the integration of ecoprint techniques with deer-motif batik inspired by the environmental and cultural identity of Cisaat Tourism Village. Unlike conventional batik studies focusing on traditional motifs, this research introduces a localized motif innovation associated with regional tourism branding and ecological sustainability (Basiroen, 2021). Ecoprint, as a contemporary batik material, also supports environmentally conscious production by utilizing plant waste and natural dyes (Putri, 2024). Furthermore, the innovation combines sustainable textile production with creative tourism experiences, including workshops and souvenir development, thereby strengthening destination uniqueness and visitor engagement.

This study contributes theoretically and practically to the fields of creative tourism, sustainable crafts, and community-based economic development. The integration of eco-friendly batik production and tourism activities can increase community income, encourage entrepreneurial capacity, and strengthen destination competitiveness (Salsabila et al., 2025). Additionally, environmentally sustainable batik production aligns with green consumer behavior and sustainable tourism trends, particularly in the consumption of natural-dye textiles (Sunarjo et al., 2021). The findings are expected to provide a replicable model for other tourism villages seeking to integrate local heritage, environmental sustainability, and creative economic development.

LITERATURE REVIEW

1. Creative Economy and Community-Based Tourism

The concept of the creative economy emphasizes leveraging local creativity, cultural heritage, and community skills as strategic assets for tourism development and regional competitiveness. In tourism villages, creative economic activities encourage the production of unique cultural products that reflect local identity and strengthen destination attractiveness. Creative tourism also promotes participatory experiences in which visitors engage directly with local traditions and artistic activities, thereby generating economic value for communities (Li & Shaw, 2022). In the context of Cisaat Tourism Village, the development of ecoprint and deer-motif batik can become a distinctive cultural attraction integrated with local tourism potential and community entrepreneurship.

The development of the creative economy has become an important driver of community-based tourism, as it supports local economic diversification and enhances community participation. Community-based tourism encourages residents to become active actors in tourism management, product creation, and cultural preservation. Research by Oktavilia et al. (2024) demonstrated that creative economic activities significantly strengthen tourism villages through local innovation, business opportunities, and collaborative empowerment. In Cisaat, local communities already possess tourism resources, handicraft potential, and natural attractions that can support the commercialization of creative products such as ecoprint batik and souvenir crafts.

Community-based tourism prioritizes local empowerment, participatory governance, and sustainable resource management. The involvement of residents in tourism planning and decision-making processes increases social ownership and ensures equitable economic benefits for the community (Sharma & Pahuja, 2025). Furthermore, sustainable tourism initiatives require capacity building, institutional collaboration, and local entrepreneurial development to maintain tourism resilience and competitiveness. Studies in rural tourism communities also emphasize that participatory approaches can strengthen cultural identity while reducing social and economic vulnerability (Lo & Janta, 2020). In Cisaat Tourism Village, community participation is essential for sustaining ecoprint batik innovation and strengthening local tourism branding.

The integration of the creative economy and community-based tourism creates synergistic benefits for cultural preservation and economic sustainability. Creative tourism activities, including workshops, handicraft production, and cultural storytelling, encourage tourists to experience local culture interactively while generating additional income for communities (Carvalho et al., 2024). Such integration also supports environmental stewardship and sustainable tourism development by using local materials and eco-friendly production systems (Suriyankietkaew et al., 2025). In Cisaat, ecoprint and deer-motif batik innovations can strengthen the destination's uniqueness, encourage creative entrepreneurship, and position the village as a sustainable cultural tourism destination.

2. Ecoprint and Sustainable Textile Innovation

The development of ecoprint techniques has become an important part of sustainable textile innovation because it utilizes natural materials and environmentally friendly dyeing processes. Ecoprinting reduces the dependence on synthetic dyes and hazardous chemicals commonly used in conventional textile industries, thereby minimizing water pollution and environmental degradation. According to Dobriyal and Sarkar (2025), ecoprint methods contribute to greener textile production by using plant-based pigments and low-impact processing methods. In tourism villages such as Cisaat, ecoprint innovation can strengthen environmentally responsible craft production while enhancing the uniqueness of local textile products.

Sustainable textile innovation also emphasizes integrating eco-design and circular economy principles into textile production systems. Circular practices encourage recycling, waste reduction, product durability, and resource efficiency throughout the textile lifecycle. Butturi et al. (2025) explained that sustainability-oriented innovation in textile manufacturing supports pre-consumer waste recovery and circular production patterns. The development of ecoprint and deer-motif batik in Cisaat Tourism Village reflects this approach by combining local resources, reusable materials, and creative production methods that support sustainable economic activities among rural communities.

Natural materials and renewable resources have become central elements in sustainable fashion and textile industries. Shahid et al. (2024) highlighted that renewable natural materials provide opportunities to reduce carbon emissions and environmental impacts while maintaining product quality and cultural value. Ecoprinting utilizes leaves, flowers, bark, and natural fibers as textile components, creating products that are biodegradable and culturally distinctive. The integration of local motifs, including deer-inspired batik patterns in Cisaat, can preserve regional identity while promoting environmentally conscious textile production. This innovation aligns with local creative industries that rely on biodiversity and traditional craftsmanship as economic assets.

The sustainability transition in textile industries also requires collaboration among local communities, creative entrepreneurs, and institutional stakeholders. Tomfohrde and Reed (2024) argued that regional fiber networks and collaborative production systems strengthen local resilience and encourage ethical fashion ecosystems. In

Cisaat Tourism Village, training programs related to tie-dye, ecoprint, and souvenir production have demonstrated the importance of community participation and skills development in supporting local entrepreneurship. Community-based creative production not only improves economic opportunities but also enhances tourism attractiveness through authentic cultural products and experiential learning activities.

3. Batik Motif Symbolism and Participatory Design

Batik motifs are more than decorative elements; they embody philosophical meanings, social identity, and local cultural narratives. Traditional Javanese batik motifs frequently symbolize moral values, cosmological beliefs, and harmony between humans and nature. Budi et al. (2025) explained that the Parang motif symbolizes resilience, leadership, and the ability to overcome adversity through dynamic visual patterns rooted in Javanese philosophy. In the context of Cisaat Tourism Village, the development of deer-motif batik can similarly reflect local biodiversity, ecological awareness, and regional identity, thereby transforming textile products into cultural representations that strengthen the village's creative economy.

The symbolic dimension of batik is also closely associated with the adaptation of natural elements into visual abstractions. Floral and fauna motifs have historically dominated Indonesian batik traditions because they communicate relationships between local communities and surrounding environments. Budi et al. (2021) emphasized that plant-based motifs in Javanese batik evolved from classical symbolism into contemporary ornamental expressions while retaining cultural significance. The integration of deer motifs into ecoprint batik innovation in Cisaat may therefore function as a contemporary interpretation of local environmental resources and tourism identity while maintaining traditional artistic values.

Modernization has encouraged the transformation of batik motifs into more innovative, market-oriented forms without compromising their cultural authenticity. Urip et al. (2025) argued that innovation in batik motifs is essential for preserving local heritage in contemporary creative industries. This transformation is relevant for tourism villages because culturally distinctive textile products can increase economic competitiveness and tourism attractiveness. The uploaded article database also demonstrates that Cisaat Village has strong tourism and craft potential through souvenir production, tie-dye training, and community-based creative activities that support local entrepreneurship.

Participatory design plays an important role in preserving traditional craftsmanship while encouraging collaborative innovation among artisans, communities, and stakeholders. Antunes and Nunes (2025) explained that participatory design facilitates knowledge exchange and co-creation processes that strengthen the sustainability of traditional crafts.

In Cisaat Tourism Village, involving local artisans, women's groups, and tourism communities in the design of deer-motif ecoprint batik can enhance collective creativity and community empowerment. Participatory approaches also align with community training initiatives in Cisaat that emphasize collaborative skill development and creative production for local economic growth.

METHODS

1. Participatory Action Research (PAR) Approach

This study employed a Participatory Action Research (PAR) approach to encourage collaborative innovation between researchers and local communities in developing integrated ecoprint and deer-motif batik products in Cisaat Tourism Village, Subang. PAR emphasizes collective participation, knowledge co-creation, and practical problem-solving through continuous interaction between academics and community members (Cornish et al., 2023).

The approach was considered appropriate because the project aimed not only to introduce textile innovation but also to strengthen local empowerment and sustainable creative economic development. Through participatory discussions, observation, and practical workshops, researchers and artisans jointly identified local potentials, cultural symbolism, and environmentally friendly textile opportunities relevant to Cisaat Village

2. Participants and Community Involvement

The participants consisted of 6 female batik artisans from Cisaat Village who were members of the Komunitas Batik Sumbangsih, led by Mr. Ujang. The participants were experienced in conventional stamped batik production and usually produced batik only upon customer orders. Community involvement was implemented actively throughout the training and innovation process to ensure that the developed products reflected local needs and capacities. According to Home (2022), active group involvement in community-based research enhances mutual learning, participation, and empowerment outcomes. The ecoprint training, therefore, functioned as a strategy to diversify local textile products while increasing artisans' creativity and economic opportunities. Five academics, consisting of, facilitated the training activities:

(i) Two lecturers from Universitas Negeri Jakarta
(ii) One lecturer from STAI AL Qudwah
(iii) One lecturer from Universitas Indraprasta PGRI,
(iv) One university student from Universitas Negeri Jakarta.

3. Training and Innovation Development Procedures

The training and innovation development procedures were conducted in Cisaat Village in April 2026 through practical workshops and mentoring sessions. The activities included scouring fabric, mordanting, leaf arrangement, steaming, pounding, and color fixation techniques for ecoprint production.

The uploaded ecoprint training document explained that natural materials, mordant solutions, and steaming methods were used to strengthen color absorption and environmental sustainability in textile production. Structured training procedures are important because systematic innovation training can improve participants' creativity, technical skills, and implementation capacity (Birdi, 2021). The participants collaboratively developed deer-inspired motifs, integrating ecoprint techniques to create distinctive tourism-based textile products that represent the cultural and environmental identity of Cisaat Village.

RESULTS

1. Training Ecoprint Process

The ecoprint training conducted in Cisaat Tourism Village was designed as an introductory, practical learning activity to strengthen participants' understanding of sustainable textile production with natural materials. The training emphasized environmentally friendly production methods by utilizing leaves, flowers, and natural pigments applied to textile fabrics.

Participants were introduced to step-by-step ecoprint procedures beginning from fabric preparation, mordanting techniques, arrangement of natural materials, steaming processes, and final color fixation. The activity also aimed to encourage creativity and product diversification among members of Komunitas Batik Sumbangsih, particularly in developing innovative textile products that could later be integrated with deer-motif batik designs inspired by Cisaat Village's tourism identity.

Figure 1 shows the ten stages of the integrated ecoprint process implemented during the community training program in Cisaat Tourism Village, Subang. The process consisted of fabric selection, scouring, mordanting, overnight soaking, boiling mordanting, tunjung application, mordant reuse, leaf arrangement, steaming and pounding techniques, and final cleaning and fixation. These stages provided participants with practical skills in sustainable textile innovation while promoting environmentally responsible craft production and the development of the local creative economy.

Figure 1. Integrated Ecoprint Training Process in Cisaat Tourism Village, Subang

Ecoprint Materials and Fabric Selection

The ecoprint training began with an introduction to the basic materials and fabrics suitable for absorbing natural dyes. Participants were introduced to several textile materials, such as cotton, silk, wool, and denim fabrics, that can absorb pigments from leaves and flowers. The facilitators explained the characteristics of each fabric and their influence on the final ecoprint results. This introductory session increased participants' understanding of environmentally friendly textile materials and sustainable production concepts.

Scouring / Initial Fabric Cleaning

The second stage involved scouring as an initial fabric-cleaning step before mordanting. Participants practiced washing the fabric using warm water, TRO, and soda ash to remove dirt and oil residues from the fabric surface. This stage was important because clean and open fabric fibers improved the absorption of natural pigments during the ecoprint process. The participants demonstrated enthusiasm because many had never applied scouring techniques in prior batik production activities.

Mordanting Process

After scouring, participants learned the mordanting process to strengthen color fixation in the fabric fibers. The facilitators explained the role of mordants in improving the durability and sharpness of natural colors produced from leaves and flowers. This process introduced participants to sustainable textile chemistry, using materials that are safer for the environment than those used in synthetic textile production.

Overnight Mordanting Technique

The overnight mordanting technique involved soaking fabrics in a solution containing alum, vinegar, soda ash, and tunjung overnight. Participants practiced preparing the mordant solution and observed how prolonged soaking influenced fabric texture and pigment absorption. The method produced stable, softer natural colors suitable for ecoprint products intended for fashion and souvenir use.

Boiling Mordanting Technique

The boiling mordanting technique involved heating the fabric together with mordant solutions in large pots. Participants learned how boiling processes accelerated color penetration into textile fibers. This method also introduced practical production techniques suitable for larger-scale ecoprint production in community-based creative industries.

Use of Tunjung in Mordanting

Participants were introduced to the function of tunjung in modifying color intensity and tonal characteristics. Smaller amounts of tunjung produced brighter leaf patterns, while larger amounts generated darker and stronger visual effects. This experimentation process encouraged creativity and design exploration among participants.

Reuse of Mordant Solution

The facilitators demonstrated how mordant solutions could be reused to reduce waste and improve production efficiency. Participants learned that sustainable textile production not only focused on aesthetics but also on environmentally responsible resource management.

Arrangement of Leaves and Flowers

The arrangement of leaves and flowers became one of the most creative stages of the training. Participants selected local leaves and arranged them on fabrics according to desired compositions and motifs. Leaf veins were carefully positioned to create clearer, more artistic natural patterns.

Coloring Process Using Pounding and Steaming Techniques

Participants practiced both pounding and steaming techniques for transferring leaf pigments onto the fabric surface. The pounding technique used wooden hammers, while the steaming technique involved rolling fabrics around PVC pipes and steaming them for approximately one to two hours. These methods produced distinctive organic textures and natural color variations.

Cleaning, Drying, and Color Fixation

The final stage involved cleaning up residual leaves, drying the fabrics in shaded areas, and fixing the colors with alum or tunjung solutions. The resulting ecoprint fabrics displayed unique natural motifs and color combinations. The training successfully improved participants' technical skills, creativity, and understanding of sustainable textile innovation for future product diversification in Cisaat Tourism Village.

The ecoprint community service program conducted in Cisaat Tourism Village, Subang, was designed as a participatory empowerment initiative to enhance the creativity and technical capacity of women batik artisans through sustainable textile innovation. The activity involved collaboration between academics and members of the Batik Sumbangsih community, particularly women artisans who traditionally produced stamped batik. Through this program, participants were introduced to environmentally friendly ecoprint techniques using natural leaves, flowers, and plant-based pigments available in the surrounding environment. The training process emphasized practical learning activities, beginning with socialization and introduction sessions, material preparation, mordanting processes, arrangement of botanical materials on fabric surfaces, steaming, and ecoprint transfer techniques, and culminating in the final cleaning and drying stages of the ecoprinted textiles. The activity not only provided participants with new technical skills but also encouraged product diversification and the development of sustainable creative entrepreneurship within the village community.

Figure 2 shows the implementation stages of the ecoprint community service training in Cisaat Tourism Village, including the socialization and introduction of ecoprint to women batik artisans, practical ecoprint training conducted by university academics, the arrangement of leaves and flowers on mordanted fabric, and the cleaning and drying process of the finished ecoprinted textiles.

Figure 2. (i) Socialization and Introduction of Ecoprint Techniques to Women Batik Artisans in Cisaat Village; (ii) Academics from Universities Teaching Ecoprint Techniques to Women Batik Artisans in Cisaat Village; (iii) Women Batik Artisans in Cisaat Village Conducting the Arrangement of Leaves and Flowers on Mordanted Fabric; (iv) Women Batik Artisans in Cisaat Village Performing the Cleaning and Drying Process on Ecoprinted Fabric

Design Workshop (Deer Motif)

Introduction to the Design Workshop

The design workshop was conducted as a collaborative creative session aimed at developing a distinctive deer motif for batik products in Cisaat Tourism Village, Subang. The workshop introduced participants to integrating traditional batik aesthetics with contemporary digital innovation using Artificial Intelligence (AI) generative tools. The deer motif was selected because it symbolized harmony with nature, ecological balance, gentleness, and the identity of rural tourism landscapes. The workshop also served to diversify local batik products beyond the conventional floral and geometric motifs commonly produced by the local community. In addition, the activity encouraged participants to explore new visual possibilities while maintaining the philosophical values of Indonesian batik traditions.

Participatory Design and Creative Exploration

The workshop involved participatory discussions between academics, students, and members of the Batik Sumbangsih community. Participants collaboratively explored various visual references related to deer anatomy, forest ecosystems, leaves, antlers, and local natural landscapes surrounding Cisaat Village. Initial sketches were produced manually before being transformed into digital prompts for AI generative platforms. Through this process, participants were able to experiment with multiple motif compositions, including stylized deer patterns, symmetrical antler arrangements, and combinations of deer imagery with ecoprint-inspired leaf textures. The collaborative atmosphere increased participants' confidence in expressing creative ideas and encouraged active engagement throughout the workshop activities.

AI Generative Process in Batik Motif Development

AI generative technology played an important role in accelerating motif exploration and visualization. Participants learned how to formulate descriptive prompts to generate batik-inspired deer motifs with different artistic styles, ornamentations, and color compositions. The generated designs offered alternative inspirations that could later be manually refined to meet batik production requirements. The use of AI also enabled faster experimentation with pattern repetition, symmetry, and ornamental variations that would traditionally require significant time to develop manually. Several generated motifs combined traditional batik line structures with

modern visual aesthetics, resulting in unique designs suitable for tourism souvenirs and contemporary fashion products.

Community Response and Product Innovation Potential

The workshop generated strong enthusiasm among participants, particularly because many had never used digital technology in batik motif development. Participants considered AI-assisted design as an innovative approach that could help expand their product portfolio and attract younger consumers. The resulting deer motifs were perceived to have strong tourism branding potential for Cisaat Village, as they reflected the local environmental identity while maintaining artistic uniqueness. Furthermore, the integration of ecoprint textures and deer-inspired motifs created opportunities to develop exclusive handmade textile products that could strengthen the village's creative economy and support sustainable cultural tourism.

Stamp Production

The stamp production process became a central outcome of the integrated ecoprint and deer-motif batik innovation program in Cisaat Tourism Village, Subang. The activity focused on developing functional and aesthetically distinctive batik stamps inspired by deer imagery and local ecological elements. The production stages included motif sketching, digital refinement using AI-assisted visualization, stamp pattern transfer, metal forming, and testing on fabric surfaces. Through this process, participants successfully transformed conceptual deer motifs into repeatable batik stamp patterns suitable for small-scale production in the creative industry.

The workshop emphasized the importance of combining traditional craftsmanship with technological innovation. Participants explored various deer-inspired visual components, including antlers, hoof patterns, forest leaves, and natural landscape ornaments. These elements were arranged into symmetrical and repetitive compositions to ensure compatibility with batik cap production techniques. AI-generated motif alternatives accelerated the exploration of pattern variations and enabled artisans to evaluate multiple aesthetic possibilities before finalizing the stamp design.

In terms of material innovation, the production process also introduced discussions regarding environmentally friendly and economically accessible stamp materials. Some participants experimented with recycled metal components and simplified production tools to reduce manufacturing costs while maintaining usability. This approach aligned with the sustainability orientation of ecoprint batik production and encouraged the optimization of local resources.

The resulting stamps demonstrated strong visual consistency during wax application trials on cotton fabric. The deer motifs produced clear outlines and harmonious pattern repetition, making them suitable for integration with natural ecoprint textures. Participants reported increased technical understanding regarding stamping precision, wax pressure control, and motif alignment. The collaborative production process also strengthened local creative capacities by encouraging knowledge exchange between artisans, academics, and community members.

Integrated Production

The integrated production process that combines deer batik motifs with ecoprint techniques was a significant innovation in Cisaat Tourism Village, Subang. This production model merged traditional batik cap methods with environmentally friendly ecoprinting to create textile products that reflected local identity, ecological awareness, and tourism-driven creativity. The integration process involved several interconnected stages, including motif development, fabric preparation, stamping, ecoprint arrangement, steaming, fixation, and finishing.

The deer motif was developed as a symbolic representation of local environmental values and rural tourism identity. Artisans combined visual elements such as deer antlers, forest leaves, grass textures, and mountain-inspired ornaments into batik cap patterns. These motifs were subsequently integrated with ecoprint compositions using local leaves and flowers collected from surrounding agricultural and forest environments. This approach strengthened the authenticity of the products while emphasizing the connection between local biodiversity and cultural expression.

The production process began with fabric scouring and mordanting to improve natural pigment absorption. Cotton fabrics were then stamped using deer-pattern batik caps and hot wax application techniques. After the wax motifs dried, artisans arranged leaves and botanical materials directly onto the fabric surface. The ecoprint process was conducted using steaming and pounding methods to transfer natural pigments and textures onto the cloth. The resulting products displayed layered visual characteristics, where structured deer motifs interacted harmoniously with organic leaf imprints and natural color gradations.

The integration of ecoprint and batik techniques also encouraged experimentation with natural dyes and sustainable materials. Participants used plant-based pigments and explored eco-friendly fixation methods to enhance color durability while reducing reliance on synthetic chemicals. This production model aligned with growing consumer interest in environmentally responsible fashion products and cultural souvenirs with authentic narratives.

From a creative economy perspective, the integrated production activity significantly enhanced artisan skills and collaborative capacity. Community members gained technical competencies in motif arrangement, ecoprint composition, color fixation, and product finishing. The process also stimulated collective creativity because artisans worked together to design unique textile patterns that could not be replicated identically. As a result, each product possessed artistic exclusivity and stronger market value.

The integrated deer batik and ecoprint products demonstrated strong potential as tourism souvenirs and local fashion commodities. Their uniqueness is derived from the fusion of traditional batik craftsmanship, ecological aesthetics, and local symbolism associated with Cisaat's tourism identity. Furthermore, the production process strengthened community empowerment by encouraging innovation, environmental awareness, and sustainable creative entrepreneurship among local artisans.

DISCUSSION

1. Strengthening Creative Economy and MSME Capacity

The development of integrated ecoprint and deer-motif batik innovation in Cisaat Tourism Village demonstrates the important role of culture-based creativity in strengthening local economic resilience. The combination of traditional batik techniques with environmentally friendly ecoprint methods created products with a distinctive local identity and higher market competitiveness. This innovation supports the argument that the combination of cultural heritage preservation and product innovation can enhance the sustainability and economic value of creative industries, especially in rural tourism destinations (Ariffin et al., 2024).

The findings also indicate that the innovation process contributed to strengthening MSME capacity by enhancing skills, fostering collaborative production, and motivating local artisans. Community participation in production activities increased technical competencies in natural dye application, ecoprint arrangement, and creative product development. Such community-based empowerment initiatives are essential for supporting tourism-oriented creative industries and generating sustainable local income opportunities (Juliana et al., 2026).

In addition, integrating ecoprint batik products into tourism activities in Cisaat Village expanded opportunities for experiential tourism and souvenir-based economic development. The innovation not only produced commercial textile products but also strengthened the village's branding as a creative and environmentally conscious tourism destination. This finding supports previous studies emphasizing that the development of the creative economy significantly contributes to tourism village competitiveness and improvements in community welfare (Oktavilia et al., 2024).

The strengthening of MSME capacity was also associated with the importance of digital transformation and marketing adaptation. Previous conditions in Cisaat indicated limited marketing systems, low digital adoption, and reliance on conventional sales channels. Through innovation and training activities, artisans became more aware of digital marketing opportunities, social media promotion, and broader consumer engagement strategies. The adoption of digital-oriented entrepreneurship is crucial for improving sustainability and innovation performance among batik MSMEs (Fawaid et al., 2026).

Furthermore, implementing sustainable production practices through ecoprint techniques reduced environmental concerns associated with conventional batik waste. The use of natural materials and eco-friendly processes reflected growing awareness of sustainable design adoption within creative economy enterprises. Sustainable production not only improves environmental responsibility but also increases product attractiveness among environmentally conscious consumers and tourists (Yang & Zhang, 2025).

2. Sustainable Tourism Branding and Market Expansion

The development of integrated ecoprint and deer-motif batik in Cisaat Tourism Village represents an important strategy to strengthen sustainable tourism branding through local cultural identity. The incorporation of eco-friendly textile production and distinctive deer motifs created a unique destination image that differentiated Cisaat from other tourism villages. Sustainable tourism branding increasingly requires authentic cultural products that combine environmental responsibility with local creativity, allowing destinations to build stronger emotional connections with visitors (Aman et al., 2024).

The innovation also supported community-based tourism development by directly involving local artisans and women batik makers in the creative production process. Community participation enhanced authenticity and strengthened local ownership of tourism products. Such participatory creative industries contribute not only to economic benefits but also to social cohesion and cultural preservation within tourism destinations (Rahmafitria & Purboyo, 2021).

Furthermore, the integration of ecoprint batik into tourism experiences expanded opportunities for experiential and cultural tourism markets. Visitors were not only consumers of batik products but also participants in creative workshops and educational activities related to sustainable textile production. This experiential approach supports sustainable destination management by integrating environmental stewardship with visitor satisfaction and cultural learning experiences (Jumadi et al., 2025).

Market expansion opportunities were also strengthened through digital promotion and sustainable storytelling strategies. Previous findings in Cisaat indicated that local MSMEs still relied heavily on limited conventional marketing channels and external orders. Through innovation in development, ecoprint and deer-motif batik products gained greater promotional potential across social media, tourism branding campaigns, and digital marketplaces. Digital communication emphasizing sustainability and local heritage is highly effective in shaping positive tourist perceptions and expanding eco-conscious consumer markets (Chen et al., 2025).

In addition, strategic collaboration among academia, local communities, tourism stakeholders, and government institutions became an important factor in increasing product visibility and destination competitiveness. Partnerships and collaborative branding can improve resource sharing, the diffusion of innovation, and access to the tourism market, particularly for rural creative economies seeking long-term sustainability (Semwal et al., 2024).

3. Institutional Collaboration and Program Sustainability

The sustainability of the integrated ecoprint and deer-motif batik program in Cisaat Tourism Village strongly depended on institutional collaboration among academia, local communities, government agencies, and creative industry stakeholders. The involvement of universities in the training and mentoring process provided not only technical knowledge but also facilitated participatory innovation and community empowerment. Collaborative partnerships between educational institutions and local communities are essential for co-designing sustainable development initiatives that address local economic and environmental challenges (Trencher et al., 2014).

The findings also revealed that community-based creative programs require stronger institutional support to maintain long-term continuity. Previous conditions in the Batik Sumbangsih community showed limitations in production facilities, access to capital, marketing systems, and environmental management. The local artisans expressed expectations for external assistance, including funding support, training programs, and market development initiatives. This indicates that sustainable creative economy programs cannot rely solely on community enthusiasm but require structured institutional networks and governance mechanisms to ensure operational sustainability.

Government institutions also play an important role in strengthening local creative ecosystems through policy support, environmental governance, and tourism development strategies. Environmental management became particularly relevant because previous batik production activities in Cisaat generated unmanaged wax waste that was disposed of in nearby rivers. Sustainable ecoprint innovation, therefore, represented not only an economic initiative but also an environmental improvement strategy aligned with responsible tourism development. Community-based environmental governance has been recognized as an important factor in strengthening sustainable local economic programs (Budiono et al., 2024).

Furthermore, collaboration among local communities, academics, and institutional stakeholders contributed to knowledge sharing and the diffusion of innovation within the creative economy sector. Open innovation approaches encourage the co-creation of products, business models, and sustainable production systems that strengthen competitiveness and adaptive capacity in rural creative industries (Bujor & Avasilcăi, 2023). Through collaborative workshops, participatory design sessions, and ecoprint training, local artisans in Cisaat gained new competencies and broader perspectives regarding sustainable textile innovation.

Long-term program sustainability also requires continuous mentoring, digital market expansion, and institutionalized community organizations. The uploaded field discussion emphasized the importance of cooperative formation, broader marketing networks, and partnerships with tourism and industrial agencies to support batik revitalization. Such collaborative ecosystems are necessary to maintain continuity of innovation, improve local resilience, and strengthen the position of Cisaat Tourism Village in sustainable creative tourism development.

CONCLUSION

The development of integrated ecoprint and deer-motif batik innovation in Cisaat Tourism Village, Subang, demonstrated the potential of combining cultural heritage, environmental sustainability, and creative tourism into a community-based economic empowerment model. The program successfully introduced a new form of textile innovation by integrating traditional batik cap techniques with ecoprint methods using natural materials and locally inspired deer motifs. This integration created unique textile products that reflected the ecological and tourism identity of Cisaat Village while simultaneously diversifying the community's batik products beyond conventional pineapple and papais motifs. Through participatory workshops, ecoprint training, AI-assisted motif development, and stamp production activities, local artisans gained opportunities to explore new creative approaches while preserving the philosophical and aesthetic values of traditional batik craftsmanship. The initiative also highlighted the importance of collaborative innovation between academia and local communities in revitalizing rural creative industries.

The program had a significant impact on community empowerment and local economic development. The involvement of women artisans from Komunitas Batik Sumbangsih strengthened collective participation, technical skills, and entrepreneurial motivation within the community. Participants acquired practical competencies in ecoprint production, natural dye application, deer motif design, and integrated textile manufacturing processes. These activities increased awareness regarding environmentally friendly production systems and sustainable craft practices. Economically, the innovation created opportunities for product diversification, tourism souvenirs, and creative entrepreneurship that could support additional household income and reduce dependence on limited conventional orders. Furthermore, integrating ecoprint batik into tourism-based activities enhanced the village's attractiveness as a cultural and educational tourism destination. The project also encouraged social empowerment by reviving local production activities that had previously declined due to limited capital, infrastructure constraints, and weak marketing systems.

Future development directions should focus on strengthening institutional collaboration, expanding digital marketing strategies, and improving long-term production sustainability. Continuous mentoring programs are needed to enhance product quality, branding, financial management, and market access for local MSMEs. Collaboration among universities, local governments, tourism agencies, the private sector, and community organizations should be institutionalized to ensure the continuity of innovation and community support. Future initiatives may also explore broader motif development inspired by local biodiversity and integrate advanced digital technologies for batik design and promotion. In addition, sustainable waste management systems and

eco-friendly production standards should be implemented to strengthen environmental responsibility within local creative industries. With consistent support and collaborative governance, integrated ecoprint and deer-motif batik innovation has strong potential to become a sustainable creative economy model for tourism villages in Indonesia.

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