From Wax to Clay: Localized Adaptation and Community Empowerment through Batik Resis Tanah Liat (Clay Resist Batik). in Kampung Hilir, Merbok, Yan, Kedah

Normaziana binti Hassan[1], Shuhaila Md Shahid[2], Zaidi Yusof[3]

Faculty of Art & Design, Universiti Teknologi MARA (Kedah branch), Sungai Petani Campus, 08400, Merbol, Kedah, Malaysia[1,2,3]

DOI: https://dx.doi.org/10.47772/IJRISS.2026.1014MG0016

Received: 04 January 2026; Accepted: 09 January 2026; Published: 24 January 2026

ABSTRACT

The Malaysian batik industry has long depended on wax resist techniques, yet environmental, health, and technical challenges have encouraged the search for safer alternatives. A major breakthrough came in 2020 with the introduction of batik tanah liat (clay resist batik) by Kraftangan Malaysia, providing an eco-friendly and cost-effective substitute for wax. Between 2020 and 2025, Clay Resist Batik advanced from experimentation to wider adoption through training programs, entrepreneurship, and retail development. This study explores the localized adaptation of clay resist techniques through the Batik Merbok initiative in Kampung Hilir, Merbok, Yan, Kedah. Villagers collaborated in a community-based effort to develop motifs such as mangroves, paddy stalks, zebra doves, Sanskrit inscriptions, and architectural forms, enriching the artistic repertoire of batik while reinforcing Merbok's cultural identity. The initiative highlights community-based collaboration, with villagers contributing to motif development, workshops, and knowledge exchange. This collaborative model supports intergenerational skill transmission, strengthens artisan agency, and ensures that creative outcomes remain locally grounded. Using qualitative and practice-based methods, this study analyses technical processes, material constraints, and design outcomes. Despite challenges related to dye adhesion and colourfastness, Clay Resist Batik incorporating localized motifs demonstrates strong potential as a heritage-rooted innovation capable of sustaining cultural continuity and creative livelihoods.

Keywords— Batik Resis Tanah Liat (Clay Resist Batik), Batik Merbok, Kampung Hilir, community-based collaboration, craft innovation

INTRODUCTION

The Malaysian batik industry has long been recognized as both an artistic and economic driver, sustaining cultural identity while contributing to the national creative economy. Traditionally, the craft has relied on batik lilin (wax-resist techniques), which, while distinctive, presents environmental, health, and technical challenges due to its dependency on paraffin-based materials and heat applications (The Malaysian Reserve, 2020). Since the early 2000s, incremental innovations have emerged within batik, focusing on digital printing, chemical dyes, and hybrid techniques. However, a transformative moment arrived in 2020 when Kraftangan Malaysia introduced Clay Resist Batik (batik tanah liat), a method that replaces wax with a clay-based resist medium.

This innovation has been heralded as safer, more cost-effective, and accessible to a wider range of practitioners (Cyber-RT, 2020).

Between 2020 and 2025, Clay Resist Batik gradually transitioned from experimental practice to commercial viability, with applications extending across training centers, entrepreneurial ventures, and community initiatives. A key example of this trajectory is seen in Batik Merbok, a localized adaptation that integrates clay resist innovation within the traditional design motifs of Kedah, particularly through community-based collaboration in Kampung Hilir, Merbok, Yan, Kedah. This article situates the development of Clay Resist Batik within Malaysia's creative economy and examines how localized adoption in Merbok reflects both heritage.

Batik has long been recognised as a cornerstone of Malay cultural identity, embodying artistic ingenuity, symbolic motifs, and regional distinctiveness. In Malaysia, particularly in Kedah, batik is not merely a fabric but a medium of cultural storytelling and economic sustenance. Against this backdrop, Batik Merbok, based in Kampung Hilir, Merbok, Yan, Kedah, has initiated an experimental project titled Batik Resis Tanah Liat (Clay Resist Batik). This project aims to integrate clay resist techniques into contemporary batik-making as a means of diversifying local textile production, while simultaneously preserving traditional craftsmanship and fostering community participation.

Rather than viewing Batik Resis Tanah Liat solely as a technical innovation, this study conceptualizes the Batik Merbok initiative as a form of living heritage practice, where material experimentation operates as a mechanism for cultural continuity. Drawing on theories of intangible cultural heritage, the clay resist process enables heritage transmission through embodied knowledge, intergenerational participation, and motif storytelling. Simultaneously, the initiative reflects principles of the creative economy by anchoring innovation within place-based cultural assets, transforming local identity into creative capital without severing its socio-cultural roots. Community participation in motif development and production further positions Batik Merbok within empowerment-oriented craft frameworks, where artisans act as co-producers of cultural meaning rather than passive recipients of institutional knowledge.

Project Objectives

The Batik Merbok initiative was conceived to integrate cultural heritage, community empowerment and innovative craftsmanship through the Clay Resist Batik technique. In particular, the project emphasises the preservation of Merbok's unique natural, cultural and historical identity, while simultaneously creating opportunities for local participation and sustainable economic development.

Against this backdrop, the objectives of the initiative are outlined as follows:

a) To provide expertise and community engagement services in the creation of Batik Merbok designs using the Clay Resist Batik technique, incorporating local motifs such as mangroves, paddy, zebra doves, Sanskrit inscriptions, and historical architectural artefacts, with the participation of residents from Kampung Hilir.

b) To produce Batik Merbok Clay Resist Batik motif designs encompassing kain pasang (unsewn fabric), innovative products, and batik clothing, with patterns that reflect Merbok's natural landscapes, cultural heritage, and historical symbolism.

c) To establish a mutual relationship between Batik Merbok and the Kampung Hilir community, fostering continuous production of batik products while generating sustainable income for local villagers through motifs that emphasize local identity and tradition.

d) To enhance the production techniques under the Batik Merbok brand, ensuring more affordable pricing (compared to block-print and hand-drawn batik), while innovating with motifs that balance traditional symbolism and contemporary appeal.

e) To elevate local batik art as an innovative cultural heritage by embedding Merbok-specific motifs (natural, cultural, and historical) into the Clay Resist Batik technique, thereby creating new market opportunities and sustainable job prospects for local batik entrepreneurs.

LITERATURE REVIEW

The development of Clay Resist Batik reflects a layered trajectory of innovation that extends from national institutions to local communities. Initially introduced by Kraftangan Malaysia as a safer, more cost-effective alternative to wax-based techniques, Clay Resist Batik emerged in response to health, safety, and production efficiency concerns. Its subsequent adoption in Merbok, however, demonstrates how local communities reinterpret institutional innovations through cultural and heritage lenses, embedding them into everyday practices with deeper symbolic meaning.

At the community level, the Batik Merbok initiative demonstrates how localised design practices can enhance the sustainability of craft innovations. By embedding motifs inspired by mangroves, paddy fields, zebra doves, Sanskrit inscriptions, architectural elements, and historical artefacts, Batik Merbok not only reaffirms Merbok's cultural identity but also empowers residents through creative and economic participation. Such initiatives resonate with the broader aspirations of Malaysia's creative economy, which emphasises heritage preservation, social inclusivity, and entrepreneurial empowerment. By leveraging academic–community partnerships, Batik Merbok also provides a model for knowledge co-production in craft innovation, where artisans, scholars, and local communities collaborate to shape new artistic directions.

At the national level, the expansion of Clay Resist Batik into retail platforms illustrates the complex balance between heritage preservation and market growth. Large-scale commercialisation through outlets such as Karyaneka and MyCraftShoppe creates opportunities for greater visibility but risks standardising designs for mass consumption. While community-led initiatives safeguard cultural authenticity and cultivate place-based identity, retail distribution can overshadow grassroots creativity. The challenge lies in balancing these dynamics so that initiatives like Batik Merbok continue to be recognised as distinct contributions to Malaysia's textile heritage rather than being subsumed into homogenised national products.

From a technical perspective, the use of clay as a resist agent opens up new creative and environmental possibilities for batik design. Traditionally, resist techniques in batik have relied on wax; however, clay introduces alternative aesthetic effects that enrich textural and visual dimensions (Khamis, 2022). The mineral content of clay interacts with dyes in unique ways, sometimes producing muted tones but also generating novel visual effects unattainable with wax. Experimental batik projects in Southeast Asia further highlight that natural substances employed as resist or dye agents can advance sustainability and environmental responsibility in textile production (Nor & Ibrahim, 2021).

This collaborative project is a strategic initiative that combines the expertise of Batik Merbok and Batik Kampung Hilir (Clay Batik) in developing a new technique in batik production. The technique represents an innovation conceptualized by Batik Merbok and officially introduced in 2025. The collaboration aims to enrich the local batik art scene by introducing a unique new technique to wider markets. Batik Resis Tanah Liat (Clay Resist Batik) is an innovation in the local batik industry that uses clay as a resist material in the fabric dyeing process.

In sum, the Batik Merbok initiative illustrates how craft innovation is most sustainable when institutional techniques are reinterpreted through local cultural identity and community participation. By embedding Merbok-specific motifs into the clay resist process, the project not only preserves heritage but also expands creative and economic opportunities for local artisans. At the same time, its integration into national and commercial platforms highlights the tension between cultural authenticity and market standardisation. Addressing this balance is central to ensuring that innovations like Batik Resis Tanah Liat (Clay Resist Batik). contribute to Malaysia's creative economy while safeguarding the distinctiveness of regional traditions.

Table 1: Timeline of Batik Clay Development in Malaysia (2000–2025)

Year/ Period	**Key Development**	**Source(s)**
2000–2019	Batik production in Malaysia remained dominated by wax-resist methods (batik lilin). Innovations in design occurred, but no nationally recognized alternative resist method was introduced.	The Malaysian Reserve (2020)
2020	Kraftangan Malaysia introduced **batik clay (clay-based resist)** as an innovation to replace/augment wax. Highlighted for safety, cost efficiency, and accessibility.	Cyber-RT (2020)
2021	PPDK Lenggong in Perak began experimenting with clay batik for training participants, particularly those with special needs.	Bernama (2021)

2022	Early adoption in Terengganu by small-scale entrepreneurs. Reported as an alternative method under Kraftangan Malaysia's programs.	Sinar Harian (2022); RTM News (2022)
2023	Batik clay promoted during Malaysia Batik Day and featured in national fashion campaigns, raising awareness of its uniqueness.	Razali (2022)
2024	Wider adoption through **PPDK/PPKK training centers in Perak** (Lenggong, Manong, Bagan Serai, Tapah, Muallim). Reported as safer and more inclusive compared to wax batik.	Bernama (2024a, 2024b)
2025	Commercialization achieved: **Karyaneka and MyCraftShoppe** marketed products such as "Shawl Clay Resist Batik," confirming retail viability.	Bernama (2024a); Razali (2022)

Table 1 describes the development of Clay Resist Batik in Malaysia reflects a gradual progression from traditional dominance to innovative adoption and eventual commercialization. A notable dimension of Clay Resist Batik's adoption has been its integration into localized design practices, particularly in Batik Merbok. In 2025, a collaboration under a community-based initiative in Kampung Hilir, Merbok (Kedah) facilitated the blending of traditional Kedah batik motifs with Clay Resist Batik resist techniques. This partnership, involving local artisans, community members, and academic institutions, illustrates how innovation can be localized to sustain regional heritage while empowering communities economically. The Batik Merbok initiative underscores the role of Clay Resist Batik not only as a technical innovation but also as a catalyst for cultural continuity and community-based entrepreneurship.

METHODOLOGY

This study employed a qualitative, practice-based research design to examine the localized adaptation of clay resist batik within the Batik Merbok initiative in Kampung Hilir, Merbok, Kedah. A purposive sampling strategy was adopted to select participants directly involved in the experimental production of Clay Resist Batik, including four female artisans from Kampung Hilir who possessed prior experience in batik-related activities. These participants were selected based on their active engagement in motif application, resist preparation, and dyeing processes, ensuring relevance to the study objectives.

Data collection was conducted through four complementary methods: (1) documentary review of heritage sources and institutional reports on batik innovation; (2) non-participant field observation documenting environmental references and production practices; (3) semi-structured interviews focusing on motif symbolism, technical challenges, and experiential reflections; and (4) experimental application through the production of eight Clay Resist Batik fabric samples.

Data saturation was achieved when recurring observations emerged across production trials, particularly regarding clay consistency, stencil limitations, dye adhesion, and motif clarity, with no new technical or thematic insights observed in subsequent iterations. Data were analysed using thematic analysis, combining inductive coding of field notes and interviews with deductive interpretation informed by heritage preservation and craft innovation frameworks. This approach ensured analytical transparency while maintaining sensitivity to the practice-based nature of batik production.

DISCUSSION

Integration of Clay Resist Batik and Batik Merbok Motifs

The integration of Clay Resist Batik with Batik Merbok motifs demonstrates how innovation in resist techniques intersects with place-based identity and cultural storytelling. While Kraftangan Malaysia's introduction of Clay Resist Batik emphasized inclusivity, safety, and technical advancement, localized initiatives such as Batik Merbok reposition batik as a living heritage, an art form that adapts to contemporary needs without losing its symbolic foundations. The incorporation of motifs such as mangroves and paddy fields highlights Merbok's

ecological and agricultural heritage, while zebra doves and Sanskrit-inspired designs reinforce cultural and linguistic continuity. Architectural and archaeological references, including mosque brickwork and traditional wood carvings, provide historical anchoring, ensuring that each motif carries both aesthetic richness and educational value. In this way, Batik Merbok not only expands the visual repertoire of batik but also serves as a medium for heritage awareness and intergenerational knowledge transfer.

Community Collaboration and Cultural Sustainability

The Batik Merbok initiative reflects how community-based collaboration can enhance cultural industries by uniting local artisans with institutional support. This aligns with broader frameworks of cultural sustainability, ensuring that traditional crafts are modernized in ways that sustain, rather than erase, their symbolic essence. The research adopted a practice-based approach, emphasising iterative experimentation and collaborative engagement between artisans and researchers. Cotton poplin was selected as the primary fabric due to its tightly woven surface, which presented both challenges and opportunities for clay resist applications. This deliberate choice allowed the study to evaluate the adaptability of clay as a resist agent in a technically demanding medium.

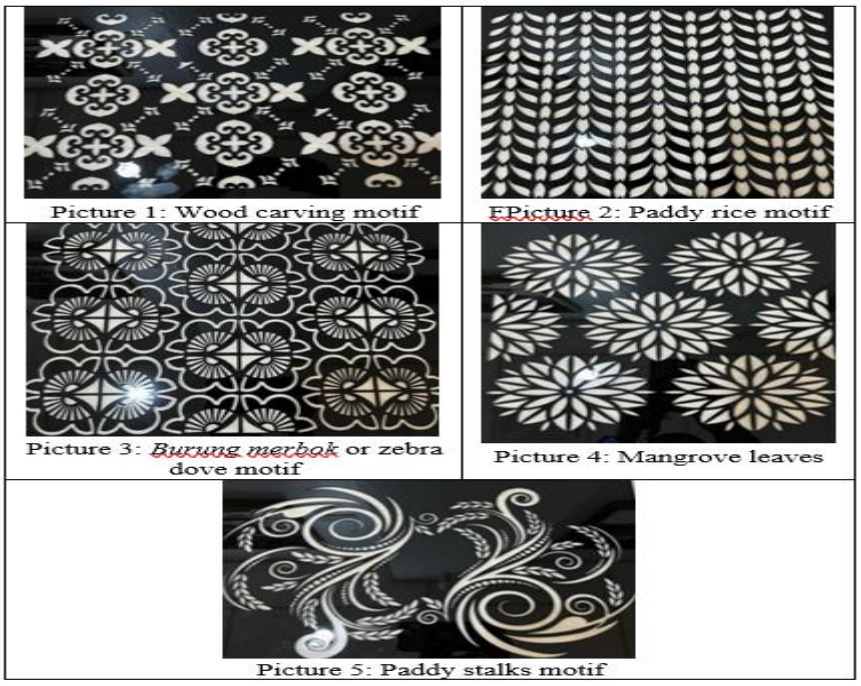
Identification and Selection of Motifs

Five primary motifs were identified for potential adaptation into Clay Resist Batik applications. These included Mangrove, Paddy Field, Zebra Dove, Sanskrit Inscription, and Architectural elements. For the first stage of production, only three motifs: Mangrove, Paddy Field, and Zebra Dove were selected. As the motifs offered strong cultural symbolism while remaining practical for trial experimentation. Their applications were developed using resist and dye techniques tailored to each motif's unique character.

Table 2: Motifs of Batik Merbok in Clay Resist Batik Techniques

Motif	Local Reference	Symbolism	Clay Resist Batik Application
Mangrove	Coastal mangrove roots	Resilience, protection	Stencil resist with indigo/green dyes
Paddy Field	Rice stalks of Kedah	Prosperity, livelihood	Layered resist with green/gold tones
Zebra Dove	Burung merbok	Harmony, pride	Central panel motifs, fine resist for feathers

Appendix A: Motifs of Batik Merbok in Clay Resist Batik Techniques


Picture 1: Wood carving motif

Picture 2: Paddy rice motif

Picture 3: *Burung merbok* or zebra dove motif

Picture 4: Mangrove leaves

Picture 5: Paddy stalks motif

Production Process and Experimentation

The development process was iterative, with each trial informing subsequent refinements. Clay mixtures were prepared with natural additives and applied to cotton poplin using both hand-drawn techniques and applicators. Fabrics were then immersed in anthrasol dye baths mixed with colour salts to produce vibrant results.

The process unfolded across four key stages:

1. Preparation of clay mixtures with natural additives.
2. Application of resist through hand-drawn motifs and applicators.
3. Immersion of fabrics in anthrasol dye baths (blue, orange-red, later yellow).
4. Washing and drying to remove clay and reveal motifs.

Experimental Outcomes and Technical Evaluation

A total of eight fabric samples were produced during the initial experimental cycle to evaluate the performance of Batik Resis Tanah Liat (Clay Resist Batik) when applied to cotton poplin fabric. The samples incorporated single- and double-layer resist applications to assess motif clarity, dye penetration, and resist durability. Observations across samples revealed recurring technical constraints, particularly related to clay consistency, stencil thickness, drying duration, and dye adhesion.

Clay application required greater material volume than anticipated, and uneven resist thickness contributed to motif expansion and blurred edges. Dye interactions with clay minerals resulted in muted colour tones and inconsistent colourfastness, particularly under humid conditions. These findings indicate the absence of standardized operating procedures as a critical limitation affecting reproducibility and scalability. Nevertheless, the experiments confirmed the feasibility of Clay Resist Batik for small-batch, community-based production, where artisanal control and localized aesthetics are prioritised over mass uniformity.

The experimental outcomes informed iterative refinements in material preparation, motif placement, and dye layering, reinforcing the value of practice-based research in heritage craft innovation. Collectively, the findings demonstrate that while Clay Resist Batik presents technical challenges, it offers significant potential as a practice-based innovation embedded within community knowledge systems.

Appendix B: Visual Documentation of Clay Resist Batik Production

Picture 6: Layering white poplin fabric for preparation

Picture 7: Selecting motif

Picture 8: Motif placement/arrangement

Picture 9: Preparing clay mixture

Picture 10: Stencil print procedure

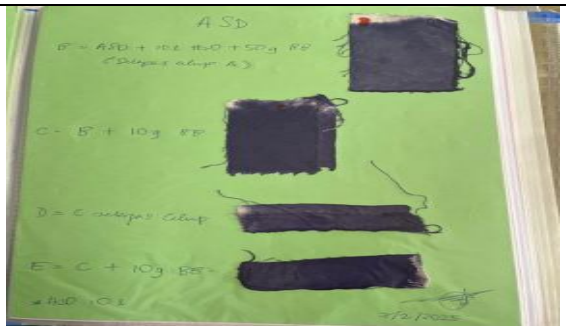
Picture 11: First layer of the clay motif

Picture 12: Burung merbok or zebra dove clay motif

Picture 13: Paddy stalks clay motif

Picture 14: A complete fabric in paddy clay motif

Picture 15: A complete fabric in paddy stalks clay motif

Picture 15: Colour mixing preparation	Picture 16: Colour mixing process
 Picture 17: Colour swatches	 Picture 18: Colour swatches according to fabric type/ colour mixture
 Picture 19: Preparation of colour bath technique	 Picture 20: Colour bath procedure
 Picture 21: Finished fabric in red chili colour	 Picture 22: Finished fabric in navy blue colour
 Picture 23: Drying process	

Comparative Table: Clay Resist vs Wax Resist (High Impact Addition)

Indicator	**Clay Resist Batik**	**Wax-Resist Batik**
Material cost	Low (locally sourced clay)	Moderate–high (paraffin, beeswax)

Production temperature	Room temperature	Requires heating
Health and safety	Safer, no fumes	Risk of burns and inhalation
Production time	Longer drying time	Faster resist setting
Motif precision	Moderate, dependent on clay consistency	High precision
Colour vibrancy	Muted to medium tones	High saturation
Colourfastness	Variable, requires optimization	More consistent
Scalability	Suitable for small-batch, community production	Suitable for mass production
Environmental impact	Low	Moderate

This comparison highlights clay resist batik's suitability for community-based, low-risk production while underscoring technical limitations that require further standardization.

Scalability and Cultural Protection

While Batik Resis Tanah Liat demonstrates strong potential as a community-based innovation, its scalability raises critical concerns regarding cultural dilution and design homogenization. As Clay Resist Batik gains commercial visibility through national retail platforms, there is a risk that localized motifs may be standardized to meet market expectations, thereby eroding place-specific identity. To mitigate this, policy frameworks could incorporate geographical indication (GI)-like recognition or community-based intellectual property protections that safeguard Merbok-specific motifs.

From a policy perspective, institutional support should prioritize small-batch production models, capacity-building programs, and certification schemes that recognize locality-driven design rather than volume-based output. Such measures would enable Batik Merbok to scale economically while preserving its cultural distinctiveness, positioning it as a model for heritage-sensitive creative entrepreneurship within Malaysia's broader creative economy.

CONCLUSION

The Batik Resis Tanah Liat initiative exemplifies how innovation can emerge through the reinterpretation of traditional techniques while remaining deeply rooted in cultural heritage. Although still in its developmental stage, the project has revealed both the aesthetic possibilities and technical challenges of incorporating clay resist methods into batik production. Central to its creative approach are motifs inspired by Merbok's natural and cultural environment, including mangroves, paddy fields, zebra doves, Sanskrit heritage, and historical architectural artefacts. These motifs anchor the initiative in local identity, ensuring that experimentation with new methods is balanced by continuity with the past. Beyond the artistic dimension, the initiative fosters strong community-based participation. Artisans in Kampung Hilir are directly engaged in skill development, creative experimentation, and knowledge transfer, positioning the project not only as a heritage preservation effort but also as a potential driver of economic empowerment. Such engagement strengthens local ownership of cultural practices while creating pathways for innovation that remain authentic to place and people.

With sustained research, systematic documentation, and greater visibility through platforms such as social media and curated exhibitions, Batik Resis Tanah Liat holds the potential to make a distinctive contribution to Malaysia's textile heritage. Its value lies in its ability to harmonize tradition with contemporary sensibilities, offering sustainable practices that are both environmentally conscious and culturally meaningful. In this way, Batik Resis Tanah Liat represents a compelling intersection between tradition and innovation. By adopting clay

resist techniques and embedding motifs that embody Merbok's identity, the initiative pushes the boundaries of aesthetic exploration while reaffirming cultural rootedness. While challenges persist in areas such as dye adhesion, colourfastness, and resist removal, the project demonstrates how practice-based research can revitalize heritage crafts and inspire sustainable innovation. Ultimately, the findings suggest that clay resist batik is not only an artisanal method but also a medium for community resilience, cultural storytelling, and the continuity of Malaysia's rich textile legacy.

ACKNOWLEDGMENT

This study has been conducted in accordance with the guidelines of the Institut Pengajian Siswazah (IPSis) at Universiti Teknologi MARA, allowing for unrestricted use, dissemination, and replication in any form, provided proper acknowledgment is given to the original author(s), source, and any modifications made. We extend our sincere gratitude to all survey respondents for their valuable participation, which was essential to the completion of this research. We would also like to express our deepest appreciation to Universiti Teknologi MARA Kedah Branch, particularly Batik Merbok, the Faculty of Art & Design, for providing the necessary support, facilities, and resources to undertake this study. Special thanks are extended to the Penyelidikan dan Jaringan Industri (Research and Industrial Networking) department for granting permission to conduct this research project. Your guidance and support have been invaluable, and we are sincerely grateful for the assistance in enabling the successful completion of this paper.

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