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FOR THE CONTRIBUTION AS:

PRESENTER

WITH PAPER TITLE:

**Sign System With Local Resources In The Ecoprint Community Of Rumah Sahabat Arae, Tenjolaya, Bogor
Regency**

BUSAN, South Korea | April 6 - 7 2026



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SIGN SYSTEM WITH LOCAL RESOURCES IN THE ECOPRINT COMMUNITY OF RUMAH SAHABAT ARAE, TENJOLAYA, BOGOR REGENCY

Noeratri Andanwertti, Siti Nurannisaa P. B.

INTRODUCTION

BACKGROUND

- There is no sign system/ marking/indication system to the location & at the location
- Risk of lost visitors & lack of area/facility information
- Potential disruption to the plant care area & inefficient training flow
- Lack of visual identity that represents community values and activities

PROBLEM STATEMENT

How to design Sign system based on Local Resources & Asset-Based Community Development- Approach:

Utilize internal assets (nature, skills, local wisdom, social networks)

Encourage community self-reliance & reduce dependence on external aid

Unique, aesthetic, & contribute to Indonesia's creative economy sector

The sign system will be designed based on local materials & recycling principles, fully aligned with the partner's sustainability vision.

PARTNER

- **Rumah Sahabat Arae**, a community focused on social contribution & environmental sustainability
- Established February 2025 in Tenjolaya, Bogor
- Vision: Embracing local resources to protect the forest and reverse climate change
- Mission: To create a positive impact through social initiatives, education, & eco-friendly practices
- Core Values: Community self-reliance, nature conservation, & sustainable economy



- **Featured programs:** Ecoprint training, women's empowerment, children's education, social service
- **Facilities built in stages:** Bamboo gazebo, guesthouse, kitchen, toilets, chicken coop, vegetable & flower garde, gallery
- Attractive program for international participants (Malaysia, Singapore, India, Spain, Netherlands) through social media management & website

PURPOSE

designing a sign system

Sign system Function:

- Providing directions and navigation.
- Conveying important information.
- Raising environmental awareness.
- Strengthening identity and branding.
- Facilitate coordination between visitors, participants, instructors, and managers

Impact:

Improve visitor experience, strengthen ARAE branding, & support training operations



Components

Information board, direction, room naming, directory, activity schedule board

Design Principle

Clear visuals, eco-friendly materials, typography & colors according to the local natural and cultural context

RESEARCH METHOD

Qualitative & Applied Research

• Stage 1. Pre-Field

- **Literature Studies:** Sign system, ecoprint, socio-cultural context of Tenjolaya
- **Initial Survey:** Identify layout, circulation, strategic points of signage
- **Problem Mapping:** Wayfinding needs, branding, user: visitor/participant.
- **Research Instruments:** Questionnaires, observation forms, field measuring tools
- **Licensing:** Coordination with village officials & ARAE managers
- **Location Mapping:** Determination of the focal point of the sign system installation

Stage 2. Field (Execution & Participation)

- **Direct Observation:** Training room conditions, circulation patterns, user characteristics
- **In-Depth Interviews:** Managers, ecoprint instructors, participants, & locals
- **Visual Documentation:** Reference design styles according to the local natural and cultural context
- **Precision Measurement:** Evaluation of visibility, lighting, & signage point layout
- **Initial Design Trials:** Direct feedback from users for design iterations
- **Final Revision & Production:** Design refinement based on field evaluation
- **Implementation:** Installation of sign systems at strategic points (training sites & gardens)

• Stage 3. Reporting

- **Usage Guidelines:** Visual guide for visitors & administrators
- **Final Report:** Documentation of the research, design, & implementation process

RESULT AND DISCUSSION



Design Concept

Clear • Local • Sustainable • User-Friendly

Functional: Information is easy for users to read, understand, and follow

Contextual: In line with the identity of nature, Rumah Sahabat Arae culture, & ecoprint values

Sustainable: Local material, eco-friendly, weatherproof

Participatory: Involving the partner & communities in planning & production

Element	Design Concept	Application
Typography	Clear fonts, high contrast, minimum size can be read remotely	Thick sans-serif, contrasting dark-light colors
	Natural & symbolic palette (green = eco-friendly), harmonious with the environment	Leaf green, earthy brown, natural beige accents Directional arrows, leaf icons, minimalist prohibition signs
Color		
Symbols & Icons	Universal, simple, consistent, text-supporting	Leaf green, earthy brown, natural beige accents Directional arrows, leaf icons, minimalist prohibition signs
Layout	Visual hierarchy is clear, breathing room is enough, user orientation is prioritized	Title > content > instructions; Wide margins
Materials & Dimensions	Weatherproof, proportional to location, lighting considerations	Bamboo, natural oil finishing
Identity Consistency	Uniform visual elements throughout the signage, in line with the ARAE branding	Logos, palettes, icon styles are consistent at all points

RESULT AND DISCUSSION

Location	Design preliminary	Description
Intersection 1 Entrance 		This intersection is near the end of the bridge as the entrance to the location. A signboard is needed to show visitors that they have arrived at the location.
Gazebo Community center and ecoprint workshop venue, dining room 		This gazebo is a large, open building, made of bamboo structure. Need a signboard showing the name of the place/area.

RESULT AND DISCUSSION

Design preliminary

Location	Design preliminary	Description
Accommodation (Guesthouse) 		The accommodation is located close to the kitchen and other guesthouses. Need a signboard showing the names of each accommodation Need a no-smoking sign

CONCLUSION & RECOMMENDATION

Conclusion

- *Sign systems are not just directions, but bridges between people, nature, and community identity.*
- *The sign system based on local resources at Rumah Sahabat Araae, to answers the visual navigation needs.*
- *Principles of visual communication + local wisdom + ecoprint philosophy, functional and meaningful signage.*

Recommendations for Development

No	Recommendations	Action
1	Strengthen User Participation	Involve trainees in co-design; Apply an inclusive user-centered approach to cultural diversity
2	Sustainable Care Guide	Create natural material maintenance modules (natural coatings, component replacement schedules, "take care of signage" training for residents)
3	Model Replication through Knowledge Transfer	Develop a documented design toolkit: design principles, material specifications, → context adaptation guidelines for other ecotourism/environmental education communities
4	Data-Driven Impact Evaluation	Conduct follow-up studies with mixed-method: POE (Post-Occupancy Evaluation*), eye-tracking, or user satisfaction surveys
5	Position as an Innovative Model	Make the Arae sign system a case study of the integration of design-ecology-empowerment in the framework of the SDGs

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Thank you

ICEBSH : 6th April 2026

INTEGRATING SUSTAINABLE MATERIALS AND LOCAL IDENTITY IN ENVIRONMENTAL GRAPHIC DESIGN FOR RURAL SOCIAL ENTERPRISES

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ABSTRACT

This study explores the integration of sustainable materials and local identity within the framework of Environmental Graphic Design for rural social enterprises. While these enterprises prioritize ecological values, they often lack cohesive spatial communication to guide visitors and reinforce their identity. Focusing on the ecoprint community of Rumah Sahabat ARAE in Bogor, Indonesia, the research employs a Participatory Action Research approach combined with Asset-Based Community Development. The study identified that the use of locally sourced organic materials (wood, bamboo, and natural resins) not only reduces the ecological footprint but also serves as a pedagogical medium for the community's ecoprint values. The resulting sign system demonstrates that EGD can effectively resolve spatial disorientation while strengthening the cultural and sustainable branding of rural social enterprises. This research provides a replicable model for balancing functional wayfinding with environmental stewardship in creative rural contexts.

Keywords: Sygn System, Sustainable Design, Participatory Design, Environmental Graphic Design, Asset-Based Community Development

1. PREFACE

Design is not just about functional aesthetics. It is a visual language that tells the soul of a place. In the context of environmental graphic design, the sign system is no longer just a direction, but a bridge of communication between the values of an environment and its visitors (Al-Rawashdeh, 2025; Ganoti & Laskari, 2023). or a rural social enterprise, the design challenge becomes more profound: how to create efficient navigation without undermining the ecological integrity and local identity that underpins their efforts (Hakim et al., 2025; Stefvany et al., 2025).

Today, many environmental education facilities in rural areas are still stuck in a visual dilemma. On the one hand, they promote sustainability, but on the other hand, their spatial information systems often use synthetic materials that are not environmentally friendly or generic designs that lose their local character (Cellucci & Villani, 2024a, 2024b). In fact, the integration of sustainable materials and local identities in the design of the sign system can strengthen the sensory experience of visitors and reinforce the educational message that is intended to be conveyed (Cellucci & Villani, 2024; Khomenko, 2020).

Rumah Sahabat ARAE, an ecoprint-based community empowerment community in Bogor Regency, is a real portrait of this challenge. Standing on an area of 8,000 m² of natural land, this community has successfully carried out its social mission through the Asset-Based Community Development method to produce environmentally friendly creative works (Sam & Fung, 2023). However, spatially, visitors often experience disorientation due to the lack of a qualified navigation system. Furthermore, the potential story behind every corner of the facility, from the botanical garden to the workshop, has not been well communicated visually.

This research was born from the desire to reunite these pieces. Using a participatory design approach, we explore how organic materials such as local wood and bamboo can be transformed into sophisticated yet low-carbon marking systems (Liu et al., 2023; Stefvany et al., 2025). The main goal is not only to make navigation easier, but to create an environmental graphic design model that is able to revive local identity in the midst of a rural landscape. Through this manuscript, researchers want to prove that for a social enterprise, sustainable design is the most honest manifestation of the human values and environmental concern they carry (Ganoti & Laskari, 2023; Sam & Fung, 2023).

2. RESEARCH METHOD

This research is not designed as a top-down design intervention, but rather a collaborative journey using the Participatory Action Research (PAR) approach (Khan et al., 2021; Low, 2020). Through PAR, it positions researchers and community members as equal partners to solve navigation challenges in the field through a continuous cycle of reflection and action (Khan et al., 2021). Its philosophical foundation is rooted in Asset-Based Community Development, a framework that does not depart from shortcomings, but focuses on the strengths and assets that the ecoprint community already has in Rumah Sahabat ARAE (Sam & Fung, 2023).

Situation Analysis and Spatial Mapping

The first step of this study is the observation of an area of 8,000 m² at the research site. Researchers conducted mapping using movement network theory to understand how visitors move and where they feel lost (Hakim et al., 2025). This activity aims to identify crucial points such as the entrance bridge and the intersection to the workshop area, which is an important decision node for visitor navigation (Widyasari et al., 2025).

Participatory Data Collection

Through guided group discussions and in-depth conversations with the directors of Rumah Sahabat ARAE, researchers explored the narrative they wanted to convey to the community and the world (Stefvany et al., 2025; Widyasari et al., 2025). This stage aims to capture the essence of local identity, from the botanical motifs that are often used to the social values they embrace, to then translate them into visual language (Al-Rawashdeh, 2025; Zhou & Li, 2026).



Figure 1. Group Discussion: Participatory Data Collection (Research Documentation)

Co-Design: Finding Materials and Looks

In the pre-design stage, through a co-design workshop, researchers with the community explore the potential of sustainable materials available around the village, such as leftover wood and local bamboo (Khan et al., 2021; Liu et al., 2023). Testing was conducted to see how this organic material could be brought together with functional environmental graphic design principles,

ensuring that each sign born had a low carbon footprint but had a high resilience to Bogor's tropical climate (Cellucci & Villani, 2024; Liu et al., 2023).

Prototype and Implementation

The next stage, these ideas are then realized into physical prototypes. The implementation stage is carried out in a cooperative manner, where community members are directly involved in the process of selecting materials, colors, and installation in the field (Thienmongkol, 2014). This active involvement is crucial; it fosters a sense of psychological ownership that ensures that the sign system will be maintained and maintained by the community as part of their own valuable asset (Sam & Fung, 2023; Stefvany et al., 2025).

Reflection and Evaluation

In the final stage, the researchers returned as observers to see how visitors interacted with the new sign system. Through satisfaction surveys and usability testing, we measure the extent to which this system can improve the efficiency of visitor orientation and its effectiveness as an educational medium about the values of ecoprint (Hakim et al., 2025; Stefvany et al., 2025). The results of this evaluation are the basis for compiling recommendations for the development of tourism villages and other social enterprises in rural areas (Stefvany et al., 2025; Thienmongkol, 2014).

3. RESULT AND DISCUSSION

Spatial Analysis and Information Hierarchy

The results of field observations on an area of 8,000 m² show that visitor disorientation occurs due to the absence of a navigation flow that is integrated with the function of space. Without an adequate marking system, the spatial legibility of the area becomes low, so that the educational potential of various zones (such as gardens and workshop areas) is not conveyed optimally (Hakim et al., 2025; Khomenko, 2020).

The discussion was conducted to determine the information hierarchy, which was divided into three main categories: area identity markers, wayfinding markers, and informative markers about the ecoprint process. The placement of navigation points is focused on "nodes" or crucial decision points where the flow of visitor movement tends to slow down or split (Ganoti & Laskari, 2023; Stefvany et al., 2025).



Figure 2. Workshop with the community (Research Documentation)

Manifestation of Local Identity Through Visual-Semiotic Integration

The design concept (Figure 3) of the sign system with the Environmental Graphic Design approach is prepared to include:

- a. **Tipography**
 - Font types are chosen that are easy to read remotely and have characters that match the identity of the place.
 - Use sufficient color contrast between the text and background to ensure readability.
 - Set a minimum font size that can be clearly read by users at various distances.
- b. **Colors**
 - Use colors that represent the character and theme of the place, and are in harmony with the surrounding environment.
 - Choose colors for contrasting backgrounds and text to make information easy to see and understand.
 - Colors can also have symbolic meanings, for example green for eco-friendly themes and ecoprints.
- c. **Symbol dan Iconography**
 - Use universal, easy-to-understand symbols and icons.
 - Use icons that are simple, clear, and consistent in visual style.
 - Make sure the icons support text messages visually and don't cause confusion.
- d. **Layout dan Composition**
 - Information should be structured in a structured manner, with a clear visual hierarchy between headings, content, and instructions.
 - Keep the balance of space so that the sign does not seem crowded, there is still empty space so that it is comfortable to see.
 - The placement of elements should consider the ease of user orientation.
- e. **Material dan Dimension**
 - Choose materials that are resistant to weather and outdoor environments if the sign system is placed outdoors.
 - Adds a coating to extend the life of natural materials
 - The size of the sign system should be proportional to the visibility and context of the location.
 - Consider lighting and finishing to keep the sign system legible under a variety of lighting conditions.
- f. **Consistency of Visual Identity**
 - Use the same design elements across the sign system such as colors, fonts, and icon styles to build a strong and recognizable identity.
 - Design adjustments to align with the branding of the training venue or the owner's organization.



Figure 3. Environmental Graphic Design Concept (Research Documentation)

The integration of local identity is carried out by transforming inspirational motifs from materials for ecoprints (leaves, flowers) and natural assets of the community into graphic elements of the sign system. The design results show that the use of symbols and iconography inspired by local flora not only serves as a navigational tool, but also strengthens the cultural narrative and uniqueness of Rumah Sahabat ARAE as a social enterprise (Liu et al., 2023; Widyasari et al., 2025).

In this context, visual identity is not seen as a purely decorative element, but rather as a medium of communication that connects traditional values with modern functions (Al-Rawashdeh, 2025; Stefvany et al., 2025). The use of natural colors that harmonize with the ecoprint palette (earth tones) ensures that the presence of this sign system does not cause visual pollution, but rather enriches the aesthetics of the rural landscape holistically (Ganoti & Laskari, 2023; Hakim et al., 2025).

Material Sustainability

In keeping with our commitment to sustainability, the material selection is focused on the organic resources available around the site, such as mahogany wood, bamboo, and natural resin coatings. Technical analysis shows that this material has sensory and ecological advantages over synthetic industrial materials such as acrylic or plastic (Cellucci & Villani, 2024a, 2024b).

The use of these sustainable materials has a dual impact:: The use of these sustainable materials has a dual impact: minimizing dependence on remote manufacturing materials by utilizing local timber (Cellucci & Villani, 2024) and the natural texture of wood creates a harmonious visual dialogue with the green environment of Rumah Sahabat ARAE, reinforcing the "eco-friendly" image that is at the core of their social business (Cellucci & Villani, 2024; Liu et al., 2023).

However, the discussion also identified challenges related to the durability of organic materials to tropical microclimates. Therefore, the application of construction techniques that allow partial replacement of components (modularity) becomes a technical solution to ensure the physical sustainability of the marking system in the long term (Cellucci & Villani, 2024; Stefvany et al., 2025).

Strengthening Social Enterprise Branding Through Participatory Design

The implementation of the Asset-Based Community Development framework proves that the active involvement of the community in the design and fabrication process significantly increases the sense of ownership (Sam & Fung, 2023). The results of the discussion showed that community members felt that this sign system was a representation of their collective identity, not just an external infrastructure intervention (Sam & Fung, 2023; Stefvany et al., 2025).

Table 1. Sign System Design & Implementation (Research Documentation)

Implementaion (Location)	Prototype Design	Description
Intersection 1 		This intersection is near the end of the bridge as the entrance to the location, "Welcome" signboard is needed to show visitors that they have arrived at the location.
Gazebo Community center and ecoprint workshop venue, dining room 		A signboard showing the name for gazebo is an open-large bamboo house. his signboard is to strengthen information and brand enterprise.
Accommodation (Guesthouse) 		Inspiration from the type of flowers used for the ecoprint that grows in the Gazebo garden.
Toilet 		Toilets that can be used by visitors, adjacent to the bamboo bridge.

Strategically, professional-quality Environmental Graphic Design implementation increases the credibility of Rumah Sahabat ARAE in the eyes of international visitors and strategic partners (Table 1). This proves that for a social enterprise in the countryside, investing in quality and sustainable design is a crucial step in strengthening institutional branding and ensuring economic sustainability through a more organized educational tourism attraction (Hakim et al., 2025; Khan et al., 2021).

4. CONCLUSION AND RECOMMENDATION

Conclusion

This research proves that a navigation system does not have to be environmentally invasive to be functional. Through the integration of sustainable materials and local identity, the project at Rumah Sahabat ARAE has shown how Environmental Graphic Design can be a manifestation of the honesty of a social enterprise (Cellucci & Villani, 2024; Ganoti & Laskari, 2023). The use of the Asset-Based Community Development method ensures that each sign that stands is not just an inanimate object, but a representation of the skills and resources possessed by the community itself (Sam & Fung, 2023).

The use of local materials (mahogany wood) with natural finishes successfully mitigates the risk of "visual pollution" that often occurs in the use of synthetic materials. The result is a directional system that feels like an organic part of the landscape, not a distraction to it.

By applying the principle of spatial legibility, this study succeeded in reducing the level of visitor disorientation in an area of 8,000 m². This success proves that contextual designs rooted in local culture (such as ecoprint motifs) are still able to meet international usability standards (Hakim et al., 2025; Thienmongkol, 2014).

Through the participatory design process, there is a deep sense of ownership from community members towards the infrastructure they build. This ensures long-term sustainability because the marking system is seen as a community asset, not just an outsider (Sam & Fung, 2023; Stefvany et al., 2025).

Overall, this integration offers a new model for rural social enterprises in which visual design is used as a tool to reinforce sustainability narratives, while enhancing service professionalism for global visitors (Cellucci & Villani, 2024; Liu et al., 2023).

Recommendation

Based on findings on the ground, several strategic steps for the future are proposed: Given that the use of natural materials is highly susceptible to tropical weather, it is recommended for communities to establish periodic maintenance schedules, including resurfacing with water-based wood coatings or natural resins to maintain durability and legibility. The existing sign system can be expanded to become an "educational information board" that tells the types of ecoprint plants at the location, to strengthen the position of Rumah Sahabat ARAE as an environmental learning center.

Further research is needed to observe the degradation rate of specific wood materials at these sites over a period of 2–5 years to find the most efficient material protection formula. Exploring the potential of combining physical elements of wood with simple digital technology, such as aesthetically engraved QR Codes, to provide access to information without adding physical burden

to the natural environment. Testing this ABCD-based design model on other types of rural social enterprises to see how different local identities can affect the choice of materials and graphic looks universally.

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SURAT TUGAS
PENGABDIAN MASYARAKAT SKEMA REGULER
PERIODE II TAHUN ANGGARAN 2025
NOMOR : 1067/Int-KLPPM/UNTAR/X/2025

Yang bertanda tangan di bawah ini:

Nama : Dr. Hetty Karunia Tunjungsari, S.E., M.Si.
Jabatan : Ketua Lembaga Penelitian dan Pengabdian Masyarakat
NIDN/NIDK : 0316017903

Memberikan tugas kepada:

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NIDN/NIDK : 0327077402
Fakultas/Program Studi : Fakultas Seni Rupa dan Desain / DESAIN INTERIOR
2. Nama Anggota Mahasiswa
 - a. NIM dan Nama Mahasiswa : 615220037 / VICTORIA ABIGAIL
 - b. NIM dan Nama Mahasiswa : 615220036 / MUHAMMAD IRFAN PRADANA

Untuk melaksanakan seluruh kegiatan Pengabdian Masyarakat (PKM) meliputi:

1. Melaksanakan Pengabdian Masyarakat sesuai dengan proposal yang disetujui dengan:
 - a. Judul Kegiatan PKM : PEMBUATAN SISTEM TANDA DENGAN SUMBER DAYA LOKAL DI KOMUNITAS ECOPRINT BUMI SAHABAT ARAE, TENJOLAYA KABUPATEN BOGOR
 - b. Dana yang disetujui : Rp. 8.000.000,- (delapan juta), diberikan dalam 2 (dua) tahap masing-masing 50%.
2. Membuat laporan monitoring dan evaluasi atas kegiatan Pengabdian Masyarakat.
3. Membuat luaran wajib berupa **Prosiding Internasional, Hak Kekayaan Intelektual (HKI) dan Produk/prototype** dari kegiatan pengabdian masyarakat
4. Membuat laporan akhir dari kegiatan PKM.

Demikian surat tugas ini dibuat dengan sebenarnya untuk dilaksanakan dengan sebaik-baiknya.

Jakarta, 1 Maret 2026

Kepala LPPM



Dr. Hetty Karunia Tunjungsari, S.E., M.Si.

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