

Advances in Community Services Research

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Environmental and Economic Empowerment through Ecoprint Training for PKK Members

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	ABSTRACT
<p>Keywords: ecoprint; family empowerment and welfare; pkk; environmental conservation; creative products; economic empowerment.</p> <p>Conflict of Interest Statement: The author(s) declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.</p> <p>Copyright © 2026 The Author(s). All rights reserved.</p>	<p>Purpose: This community service activity aims to empower members of the Padanglampe Village PKK through training in the manufacture of ecoprint products made from local leaves as an effort to preserve the environment and create additional sources of income. The program is designed to improve technical skills, foster ecological awareness, and open up creative economic opportunities based on local potential.</p> <p>Research Design and Methodology: The methods used include socialization, entrepreneurship presentations, demonstrations of ecoprint techniques, hands-on practice in creating motifs on tote bags, and interactive discussions and marketing assistance. The activities are planned for August 2025 with a target of 15-20 PKK members. A participatory approach is used to ensure that participants truly master the skills.</p> <p>Findings and Discussion: This activity improved participants' understanding of the importance of environmentally friendly natural resource management and introduced ecoprint as an easy, economical production technique with high selling value. Participants demonstrated improved skills in producing tote bags with local leaf motifs and gained an understanding of simple branding and marketing processes for marketing environmentally friendly products.</p> <p>Implications: This program has practical implications for empowering rural women, particularly by creating green business opportunities that support sustainable development goals. From a managerial perspective, this program encourages the formation of community-based business groups and the development of market-ready creative products. The results of these activities are expected to strengthen the community's economic independence through sustainable ecoprint businesses.</p>

Introduction

Environmental conservation and community economic empowerment are fundamental to sustainable development and a significant concern in many countries, including Indonesia. One approach currently being developed is the creative use of natural resources, particularly natural dyes for textiles, which have been proven to be more environmentally friendly than synthetic dyes, which can pollute soil and water. Protecting nature is a moral obligation for humans as creatures living on earth; if the environment is not protected, ecological damage will continue to increase, with a direct impact on the survival of communities. In this context, the ecoprint technique is a relevant innovation because it utilizes organic materials such as leaves, flowers, and twigs as natural sources of color while

producing unique patterns on fabric. The ecoprinting process is relatively easy, does not require significant capital, and does not produce hazardous waste. This technique can be done by tapping or pounding, boiling, or steaming, with pounding being the most commonly used because it is simpler and faster. The process only requires arranging leaves on the fabric's surface, covering it with another piece of cloth, then pounding it with a wooden mallet, and finally rinsing it with alum or vinegar. In Padanglampe Village, the potential of ecoprint as a business opportunity for the PKK group has not been optimally developed. Discussions with the Village Secretary revealed that the community's interest in entrepreneurship remains low, as many businesses have gone out of business in a short period. In addition, the PKK group does not yet have a superior product that can be a steady source of income, and it lacks knowledge of branding and marketing strategies. The phenomenon of low product creation skills, limited market access, and lack of environmental awareness are essential reasons for implementing local leaf-based ecoprint assistance to increase creativity, productivity, and economic independence in the community.

Several studies have confirmed that ecoprint is not only environmentally friendly but also has significant economic potential for the community. Various studies have shown the effectiveness of this approach (Saptutyningsih & Wardani, 2019). This technique utilizes local leaves to create unique textile prints that are environmentally friendly and economically promising. Imelda & Yanuarm (2020) note that ecoprinting is particularly suitable for women's groups, as its production process is light and easy to learn. The advantages of this method include the use of readily available natural materials, the creation of unique designs that cannot be replicated, the potential for increased family income, and the contribution to environmental awareness. Sifaunajah & Tulusiawati (2020) further emphasize that such initiatives can transform village natural resources into creative economic opportunities for community development. Various community service studies also show that ecoprint training equips PKK members with the skills to transform organic materials into textile products (Azhar et al., 2022). These programs have been proven to address three important objectives: waste reduction, skills development, and income generation. Untari et al. (2022) reported that ecoprint training, involving hands-on practice from leaf collection through mordanting, printing, and product development, has a significant and applicable empowering impact. Subsequent studies also show similar successes. Wahyuningsih et al. (2024) demonstrate significant skill improvement, with participants' knowledge increasing from 76% to 93% and producing 37 unique ecoprint T-shirts. Kurniasih et al. (2025) affirm the potential of this approach for women's creative entrepreneurship. The ecoprint technique, which uses natural plant pigments, not only creates economic value but also promotes environmental conservation, making it relevant and applicable to community empowerment programs.

Although previous studies have shown that ecoprint has excellent potential as an environmentally friendly natural dyeing technique and a means of women's economic empowerment, several empirical and theoretical gaps remain. Previous studies have confirmed the effectiveness of ecoprint in improving participants' skills through nature-based training approaches (Saptutyningsih & Wardani, 2019), creating creative business opportunities based on local potential (Sifaunajah & Tulusiawati, 2020), and providing economic added value through natural textile products that are in demand in the market (Imelda & Yanuarm, 2020). In addition, ecoprint training has also been proven to equip PKK members with the skills to process organic materials into marketable products, as shown by Azhar et al. (2022), who confirmed that the training program was able to achieve three objectives at once, namely waste reduction, skills improvement, and income increase. However, most of these studies focus solely on improving technical competence and short-term success, without adequately analyzing how business sustainability can be ensured after training is complete. Psychological and social barriers such as fear of starting a business, lack of marketing literacy, low self-confidence, and lack of branding knowledge have also not been comprehensively studied. Untari et al. (2022) demonstrated the impact of empowerment through direct practice but did not discuss strategies for surviving in the market. Even the findings of Wahyuningsih et al. (2024), which reported an increase in knowledge from 76% to 93% and produced 37 ecoprint T-shirts, did not explain how these products could be marketed sustainably. Kurniasih et al. (2025) emphasize the potential of ecoprint in creative entrepreneurship, but have not integrated aspects of digital marketing and local product identity. This condition

indicates the need to develop a more comprehensive mentoring model that focuses not only on production but also on strengthening business capacity at the community level.

Based on this gap analysis, this research and community service offer a novelty in the form of an integrated mentoring approach that not only focuses on the technical skills of ecoprinting but also emphasizes strengthening business capacity through the integration of creativity training, the formation of local product identity, environmental education, and sustainable marketing strategies. This novelty is further strengthened by the fact that the assistance activities are designed contextually in accordance with the psychological and social conditions of the Padanglampe Village community, which previously showed low interest in entrepreneurship due to experiences of business failure, a lack of understanding of branding, and the absence of reliable PKK flagship products as a source of steady income. In addition to teaching ecoprint techniques ranging from tapping or patting, boiling, and steaming, this research also developed a long-term coaching model by ensuring that participants not only produce products but are also able to read market opportunities, manage online and offline marketing, and create distinctive regional motifs based on local leaves as a competitive product identity. This research aims to improve the technical skills and creativity of the Padanglampe Village PKK, foster ecological awareness through the use of natural materials, and build economic independence by forming independent, sustainable ecoprint business groups. Thus, this study not only expands on previous studies but also provides practical contributions in the form of a more comprehensive and replicable assistance model that can be applied in other villages as a community empowerment strategy grounded in local potential and environmental sustainability.

Literature Review

Ecoprint Products

Ecoprint products are textile works that use natural printing techniques, utilizing the shapes, colors, and pigments of leaves, flowers, or other plant parts, which are transferred directly to the fabric's surface through pressure, heat, and natural fixation. This concept combines art, science, and sustainability because the entire production process uses materials sourced from nature, making it environmentally safe. In the context of natural dyeing, the use of plant pigments has proven to be a more environmentally friendly alternative to synthetic dyes, as shown by Patel & Kanade (2019), who explain that chemical dyeing produces harmful residues and requires greater energy for production. In contrast, ecoprinting creates unique patterns without the need for harmful chemical processes because the leaves and flowers used contain natural pigments that can transfer to fabric through a simple process. Maulik et al. (2022) emphasize that using natural dyes on textiles not only maintains aesthetic quality but also reduces the risk of toxicity to artisans and the surrounding environment. In practice, ecoprint products utilize the natural characteristics of plants to produce truly unique and irreplicable motifs, creating high artistic value. It is this uniqueness that makes ecoprint increasingly popular as a creative, ethnic-inspired, and environmentally friendly product.

In addition to their aesthetic value, ecoprint products also have significant ecological value, as the production process prioritizes recycling and minimal waste. The use of leaves as a source of natural patterns and pigments is a way to utilize biomaterials that were previously often wasted, such as teak or ketapang leaves. Benli's (2024) research on bio-mordants shows that the use of natural fixing agents improves color quality while reducing dependence on synthetic chemicals commonly used in the textile industry. These findings support ecoprint practices that prioritize sustainability and environmental friendliness. Ayu et al. (2022) demonstrated, through research on the use of teak leaves as an ecoprint material on silk fabric, that local leaves can produce stable patterns and colors, making them suitable for the production of various textile products, such as scarves, fabrics, and tote bags. In addition, Klančnik's (2024) research shows that leaf-based natural printing techniques can be applied not only to cotton fabrics but also to polyester and paper, opening up broader innovation opportunities for ecoprint product development. This diversity of media and materials makes ecoprint an inclusive and adaptable technique across various creative contexts.

Ecoprint products are gaining economic value as consumer interest in environmentally friendly products grows. In addition to the relatively simple production process, leaf and flower raw materials are readily available, enabling ecoprinting by communities across various regions, including rural

women's groups. Dey et al. (2025) explain that the global trend in natural dyeing shows an increasing demand for sustainable products, including plant-based textiles. Ecoprint products are part of this trend because they combine ecological and aesthetic values. By utilizing natural pigments, each piece of ecoprint fabric offers authentic, unique patterns that tell the story of its plant origins. The uniqueness of these patterns increases the products' selling value because they offer characteristics not found in mass-produced factory products. This aligns with the findings of Imelda & Yanuarm (2020), who state that plant-based printing techniques provide significant added value to products, especially when developed into high-value creative products. In the context of product development, ecoprint can be applied to a range of media, including tote bags, clothing, accessories, and home decorations. This variety of applications provides ample opportunities for MSMEs and creative communities to develop competitive product portfolios. Thus, ecoprint products are not just a coloring technique but also a holistic approach that sustainably combines art, ecology, and creative economy.

Environmental Conservation Efforts

Environmental conservation efforts are planned actions aimed at preserving, restoring, and maintaining the quality of ecosystems so they continue to function optimally, supporting the sustainability of human life and other living creatures. This concept has become increasingly important as environmental damage from the exploitation of natural resources, industrial pollution, and changes in land use has risen. Ardoin et al. (2020) explain that environmental conservation efforts are not only about protecting natural areas but also include environmental education that can change behavior and raise public awareness of the importance of conservation. A broader perspective is presented by Mensah (2019), who emphasizes that environmental conservation is one of the main pillars of sustainable development because it encompasses protecting natural resources, reducing waste, and managing ecosystems wisely to ensure the welfare of future generations. Thus, environmental conservation serves as the foundation for all aspects of social, economic, and ecological development. Furthermore, the idea of environmental conservation reflects the close relationship between humans and nature and requires a holistic approach. Zhang et al. (2023) note that effective environmental governance is a key component for achieving significant conservation outcomes, especially in areas under high ecological pressure. This confirms that environmental conservation is not solely about technical activities but also involves evidence-based governance, regulation, and planning. Zeng et al. (2025) reinforce this view by showing that conservation policies informed by research results and impact analysis can significantly increase the effectiveness of ecosystem protection.

Environmental conservation efforts cannot be separated from the role of education, governance, and policy interventions that encourage behavioral change and increase conservation effectiveness. Ardoin et al. (2020) emphasize that environmental education plays an important role in fostering more conscious and sustainable conservation behaviors, especially when communities are directly involved in conservation practices such as land rehabilitation or waste management. In a global context, Harivelo & Harifidy (2022) show that countries such as Madagascar have improved environmental quality by integrating conservation and sustainable development programs, which, in the long term, support ecological resilience. In addition to education, strong environmental governance also plays an important role. Zhang et al. (2023) emphasize that the success of conservation is highly dependent on the quality of governance, including monitoring mechanisms, community participation, and inter-agency collaboration. Furthermore, evidence-based planning is crucial in achieving conservation goals. Harivelo & Harifidy (2022) found that conservation policies based on impact analysis can encourage more targeted decision-making in protected area management. The study shows that policies that do not consider scientific data tend to create a gap between conservation goals and implementation. Alberts et al. (2024) reinforced these findings by identifying inconsistencies between conservation policies and their implementation across protected areas, which often hinder the effectiveness of ecosystem preservation. These dynamics show that environmental preservation requires a strategic planning framework that can integrate social, economic, and ecological aspects in a balanced manner.

In addition to covering education, governance, and policy, environmental conservation efforts are closely related to the sustainability of social and economic practices in the community. Joseph (2025) highlights the importance of integrating sustainable tourism and environmental conservation to

balance natural resource use and ecological protection. In this context, the community plays a significant role in environmental management through various conservation practices such as waste reduction, waste sorting, and local vegetation rehabilitation. Rivo-López et al. (2025) add that environmental sustainability reporting across industrial sectors also plays an important role in monitoring and evaluating environmental conservation efforts undertaken by various institutions. Transparent and comprehensive reporting encourages accountability and raises public awareness of the importance of healthy ecosystems. In addition, environmental conservation efforts are influenced by community participation as a form of collective responsibility. Community involvement in local conservation programs has proven effective in promoting ecosystem sustainability by providing a direct understanding of local environmental conditions and ecological needs. Joseph (2025) emphasizes that community empowerment is a key driver of successful environmental conservation, especially in areas highly dependent on natural resources. Thus, environmental conservation must be understood as a multidimensional process that encompasses ecological, social, and economic dimensions. The integration of these three aspects provides a strong foundation for long-term environmental sustainability. Environmental conservation efforts ultimately aim to maintain the quality of human life by protecting biodiversity, reducing ecological disaster risks, and wisely and responsibly using natural resources.

Additional Sources of Income

Additional sources of income are earnings beyond primary income, earned through additional productive activities such as self-employment, side jobs, or informal economic activities, which can improve financial well-being. This concept is crucial for low-income or unstable-income groups, as additional income serves as a survival strategy and a means to improve family finances. Hendratmi et al. (2022) explain that women across various regions of Indonesia often engage in side businesses as an economic strategy to strengthen household finances, particularly in micro-businesses and skill-based activities. The importance of additional income is even more apparent in times of economic uncertainty, prompting many families to develop alternative economic activities to maintain financial resilience. Suminah et al. (2022) emphasize that additional income can improve the economic performance of micro-entrepreneurs, especially when their main economic activities are affected by external changes. Therefore, additional sources of income are an important pillar in improving household economic capacity through economic diversification.

Additional sources of income also improve the economic resilience of rural and urban communities by diversifying livelihoods. Akosikumah et al. (2025) found that household participation in non-agricultural activities can improve the economic status and food security of families in Ghana, demonstrating that livelihood diversification not only increases income but also strengthens economic stability. Increased efficiency in certain economic activities can drive income mobility and improve household welfare. In a broader context, Haile et al. (2025) show that diversification of income sources has a positive effect on the nutritional security and economic independence of rural households. This reinforces the argument that additional income significantly improves the community's quality of life, mainly when these activities are carried out in a planned and sustainable manner. In addition, Barnett et al. (2021) emphasize that additional income earned by women can improve bargaining power and economic empowerment, confirming that it affects not only the economy but also social and psychological aspects.

Sources of additional income also play an important role in driving local economic growth, primarily through micro-businesses run independently by the community. Ordóñez Vizcaíno et al. (2024) show that access to business support services, such as microcredit, can boost income and positively impact the surrounding economy, thereby triggering economic growth at the community level. Zeeshan et al. (2022) add that rural households in India that earn additional income from non-agricultural activities are better able to meet their basic needs and develop productive assets, confirming that additional income plays an important role in improving long-term welfare. Through alternative economic activities, communities can use resources available in their surroundings to reduce dependence on a single livelihood. Thus, additional sources of income are not merely extra income, but an adaptive economic strategy in the face of changing social, economic, and

environmental conditions. In the context of community empowerment, additional income enables individuals to strengthen their financial capacity, improve their quality of life, and open new, more stable and sustainable economic opportunities. Overall, this concept underscores the importance of economic independence through the use of skills, creativity, and local opportunities, enabling communities to build stronger economic resilience.

Research Design and Methodology

The method used to implement this community program is to provide training through presentations and live demonstrations on how to make products from local leaves printed with the ecoprint technique. Partners were selected based on previous visits, audiences, sharing, and discussions with community partners, specifically the Padanglampe Village PKK.

The methods used in this community service activity include training, education, and guidance on making ecoprint products using local leaves, which will be practiced directly by the service team, followed by discussion, sharing, and question-and-answer sessions. The program agreed upon with the partners is carried out using the following methods:

1. Delivering presentation materials on entrepreneurship to encourage interest in entrepreneurship among partners.
2. Providing education on the importance of protecting the environment, which can be done by running environmentally-based businesses so that the businesses run are not solely profit-oriented.
3. Practicing firsthand the procedures for making ecoprint products using local leaves as examples of environmentally friendly products, thereby providing an alternative business opportunity and a source of additional income for the community.

Under the program agreed with the partner, a plan is needed that includes the implementation of activities and the evaluation of the community service program. The plan for the implementation of activities and program evaluation is as follows:

1. Activity Implementation Plan
 - a. Preparation stage:
 - 1) Observation and discussion with partners to understand local needs and potential.
 - 2) Preparation of training modules and mentoring schedules.
 - 3) Provision of supporting tools and materials (fabric, plain tote bags, leaves, fixing agents, and pressing tools).
 - 4) Conducting program socialization to partners who will participate in the targeted activities of 15-20 people
 - b. Training stage (Workshop):
 - 1) Live demonstration. The volunteer team gave a live demonstration of how to make ecoprints.
 - 2) Participatory practice. PKK members try to make ecoprints with assistance.
 - 3) Results Evaluation: After completing the entire series of training activities, participants will be invited to discuss/share and ask questions, as well as engage in group discussions to improve product quality.
 - c. Marketing and entrepreneurship stage:
 - 1) Training on creating promotional content on social media
 - 2) Assistance in opening online stores (Shopee, Tokopedia) or selling through local communities.
 - d. The participation of partners in the overall implementation of the program is expected to enable all partners to consistently implement the training results to the maximum extent possible, thereby providing benefits and personal development for the partners.

Findings and Discussion

Implementing Team Structure

The structure of the Community Service Program (PkM) committee for Desa Mitra in this activity consists of an implementation team of five (5) people. The following is the structure for the implementation of this community service activity:

Table 1. Implementation Team Structure

	Implementing Team	Position	Field of Expertise	Tasks in Community Service Activities
1	Kirana Ikhtiari, SE., M.Ak	Chairman	Accounting	Training, Counseling, and Report Writing
2	Dian Eka Pusvita Azis, SH., MH	Member	Law	Training, Counseling, and Report Writing
3	Dina Surya Ningsih	Member (student)	Accounting	Documentation
4	Muh. Sadham H	Member (student)	Accounting	Creating PKM activity files (activity implementation reports and attendance records for PKM activity participants)

Type of Activity, Time, and Place of Activity

This community service activity was carried out through comprehensive training and direct assistance to members of the Padanglampe Village PKK in making ecoprint products from local leaves. The activity began with a socialization session and presentation on the importance of environmentally-based entrepreneurship and an introduction to the ecoprint technique as a production method that is easy to apply, requires low capital, but has high economic value. At this stage, the community service team explained the urgency of entrepreneurship and showed examples of creative products that could be sold with minimal capital, one of which was a canvas bag decorated using the ecoprint technique. Next, the activity continued with hands-on training, where the community service team demonstrated the steps of making patterns on fabric or tote bags using the ecoprint method and invited participant representatives to practice the process using local leaves available in the surrounding environment. After the practice session, the event continued with interactive discussions and experience-sharing between the community service team and participants on business opportunities, production challenges, and the marketing potential of ecoprint products. In addition to providing technical training, the program included entrepreneurship education and marketing strategies, including training in promotional content creation and in opening online stores to support both online and offline product marketing. The training methods included live demonstrations, participatory practice, and intensive mentoring, enabling participants to gain a comprehensive understanding and continue the production and marketing processes independently.

Target Community Participants

The participants in this Community Service Program (PkM) are members of the PKK (Family Empowerment and Welfare) of Padanglampe Village.

Review of Achievements

A review of the activities' results shows a significant improvement in PKK members' skills in ecoprint techniques, enabling them to produce environmentally friendly, economically valuable products, such as bags with unique local leaf motifs. The products are ready for sale, with quality continually improved through joint evaluation with partners. The active participation and enthusiasm of the participants during the training were very high, indicating that the training was successful in fostering interest and awareness of the importance of environmentally oriented business innovation and the potential for additional income. Marketing channels, both online and offline, are now operational and receiving positive responses from the surrounding community.

Benefits of Community Service Activities for partners and the community (outcome)

The benefits of this activity for partners and the community are extensive, including encouraging community members, especially women in the PKK, to become entrepreneurs through environmentally friendly products. This activity adds to the variety of low-capital home businesses that use local materials from the surrounding environment, thereby helping maintain environmental balance through the application of the reduce, reuse, recycle principle. This assistance also provides additional sustainable income and fosters awareness and responsibility for protecting nature at the community level.

Documentation of Community Service Activities



Figure 1. The Community Service Team shows examples of applying the Ecoprint Technique to Canvas Bags.



Figure 2. The community service team invites representatives of the PKK to practice making canvas bags using the ecoprint technique.



Figure 3. The head of the Pengabdian team and PKK members show off the canvas bags made with the ecoprint technique.

Activity Evaluation

The evaluation of activities shows that the training method, which combines theory, hands-on practice, and interactive discussions, is successful. Partners show a noticeable improvement in their technical skills in ecoprinting and their understanding of entrepreneurship. However, challenges in marketing, especially those related to branding and social media, still require ongoing support. The implementation team continues to provide assistance to overcome these obstacles, ensuring the community service results are sustainable.

Problems and Obstacles

The problems and obstacles encountered include low initial interest from the community due to prior business failures, limited innovation and product marketing knowledge, and technical production challenges that require intensive support. In addition, suboptimal access to digital markets is a barrier to broader business development.

Conclusion

Based on the results of discussions and evaluations of the activities carried out, it can be concluded that the community service activities in the form of training and assistance in making ecoprint products from local leaves in Padanglampe Village have succeeded in improving the technical skills of PKK members in making environmentally friendly products that have economic value. The training participants showed a high level of interest and awareness of environmental preservation through the use of natural materials and ecoprint techniques. This activity also raised awareness of the importance of environmentally based entrepreneurship and the wise use of natural resources, thereby opening up opportunities for sustainable additional income for the community. Practical training methods, such as presentations, demonstrations, hands-on practice, and interactive discussions, provided participants with a deep understanding of how to produce products based on the reduce, reuse, recycle concept. Overall, this program successfully empowered the local community to protect the environment and improve their quality of life by developing innovative ecoprint products using local resources.

Based on the observations and evaluation of the implementation of the Community Service Program (PKM) in Mitra Village, several recommendations have been made, namely:

- The next community service activity should take the form of a workshop on the manufacture of more applicable and environmentally friendly products, so that partners can more easily understand and practice the techniques of manufacturing recycled products.
- Marketing assistance, particularly branding and the use of social media, needs to be continued intensively so that production results can be marketed more optimally and the partners' businesses can develop sustainably.
- Diversification of ecoprint products based on other local resources can be developed so that partners have more diverse business alternatives and broader market appeal.
- Encourage the formation of independent business groups to strengthen the involvement and independence of PKK members in the production and marketing of environmentally friendly products.
- The dissemination of information and service results through mass media, journals, and video documentation needs to be continued to inspire and raise public awareness about the importance of green entrepreneurship.

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