



## LITERACY AND ECONOMIC ACCELERATION THROUGH GREEN ECONOMY IN COASTAL COMMUNITIES

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### ABSTRAK

Kegiatan pengabdian kepada masyarakat ini bertujuan untuk meningkatkan literasi ekonomi hijau serta mempercepat aktivitas ekonomi masyarakat pesisir melalui pemanfaatan sumber daya lokal secara berkelanjutan. Program dilaksanakan di Desa Pantai Bahagia, Kecamatan Muara Gembong, Kabupaten Bekasi, dengan pendekatan partisipatif dan experiential learning. Kegiatan meliputi pelatihan literasi ekonomi hijau, praktik pembuatan batik menggunakan pewarna alami dari daun mangrove, diskusi kelompok, serta pendampingan pasca pelatihan. Peserta kegiatan merupakan masyarakat pesisir, khususnya perempuan, yang terlibat dalam aktivitas ekonomi skala mikro. Hasil kegiatan menunjukkan adanya peningkatan pemahaman peserta mengenai konsep ekonomi hijau, peningkatan keterampilan teknis dalam produksi batik ramah lingkungan, serta meningkatnya kesadaran terhadap pengelolaan sumber daya secara berkelanjutan. Selain itu, peserta mampu menghasilkan produk batik yang memiliki nilai jual dan menunjukkan motivasi untuk mengembangkan usaha berbasis ekonomi hijau. Meskipun masih terdapat keterbatasan dalam skala produksi dan akses pasar, program ini memberikan kontribusi nyata dalam pemberdayaan masyarakat serta menjadi model yang dapat direplikasi untuk pengembangan ekonomi berkelanjutan di wilayah pesisir.

### ABSTRACT

This community service activity aimed to improve green economy literacy and accelerate the economic activities of coastal communities through the sustainable utilization of local resources. The program was conducted in Pantai Bahagia Village, Muara Gembong District, Bekasi Regency, using participatory and experiential learning approaches. The activities included green economy literacy training, batik-making practice using natural dyes derived from mangrove leaves, group discussions, and post-training assistance. The participants were coastal community members, particularly women involved in micro-scale economic activities. The results showed an improvement in participants' understanding of green economy concepts, enhanced technical skills in producing environmentally friendly batik products, and increased awareness of sustainable resource management. In addition, participants were able to produce batik products with market value and demonstrated motivation to develop green economy-based businesses. Although there were still limitations in production scale and market access, the program made a tangible contribution to community empowerment and may serve as a replicable model for sustainable economic development in coastal areas.

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## PENDAHULUAN

Based on the initial assessment and field observations conducted with community partners in Pantai Bahagia Village, the majority of household heads rely on fishing as their primary livelihood, while approximately 96% of women in the village do not have independent sources of income and depend largely

on household earnings derived from fish catches. This economic structure reflects the vulnerability of coastal households, where income stability is highly dependent on fishing seasons, weather conditions, and fluctuating market prices. Women's participation in productive economic activities remains limited due to restricted access to skills training, capital, and market networks.

Previous studies on coastal community empowerment indicate that women in fishing villages often face structural barriers to economic participation, including low levels of vocational skills, minimal entrepreneurial literacy, and limited opportunities to diversify household income (Mallapiang et al., 2020; Nalhadi et al., 2020). As a result, household economies tend to be fragile, particularly during periods of declining fish catches. Empowerment-oriented interventions targeting women have been shown to significantly enhance household resilience and community welfare when alternative income-generating activities are introduced (Cahyaningrum et al., 2025).

**Table 1.** Population Data in Muara Gembong District (BPS Kabupaten Bekasi, 2018)

Age Group	Number of Male Population	Number of Female Population	Total
0-4 years old	1.8869	1.767	3.636
20-24 years old	1.711	1.618	3.329
More than 60 years old	1.102	1.058	2.168

In addition to economic limitations, coastal communities also face increasing environmental pressures that threaten the sustainability of their primary livelihoods. Coastal degradation, including mangrove deforestation, abrasion, and declining marine biodiversity, has reduced the productivity of fisheries and weakened the ecological resilience of coastal areas. This situation highlights the urgency of integrating environmental conservation with economic development strategies. Without sustainable resource management, communities risk experiencing a dual crisis—declining environmental quality and worsening economic vulnerability. Therefore, approaches that simultaneously address ecological preservation and economic empowerment are essential for long-term community resilience.

The concept of a green economy offers a strategic pathway to address these challenges by promoting economic activities that are environmentally sustainable, socially inclusive, and economically viable. In the context of coastal communities, green economy practices emphasize the responsible, value-added use of local natural resources. By transforming underutilized resources such as mangrove leaves into marketable products, communities can generate alternative income while preserving ecosystem functions. This approach not only strengthens local economic capacity but also fosters environmental stewardship, making it highly relevant for community empowerment initiatives in coastal regions.

In this context, training programs that integrate green economy principles with locally available natural resources are highly relevant. Mangrove ecosystems, which are abundant in Pantai Bahagia Village, offer not only ecological benefits but also economic potential when sustainably utilized, for example, as natural dyes for batik and textile products. Studies published in nationally accredited journals (SINTA 1–5) demonstrate that community-based training in environmentally friendly production techniques can improve women's technical skills, foster entrepreneurial motivation, and increase household income (Wibowo & Lestari, 2022; Harefa et al., 2023).

Therefore, the training activities implemented in this program are expected to enhance the skills of women and community members in Pantai Bahagia Village, enabling them to develop alternative livelihoods beyond fishing-dependent income. By combining hands-on technical training, green economy literacy, and basic business management skills, the program aims to strengthen women's economic roles, stimulate local economic growth, and contribute to sustainable community development in coastal areas.

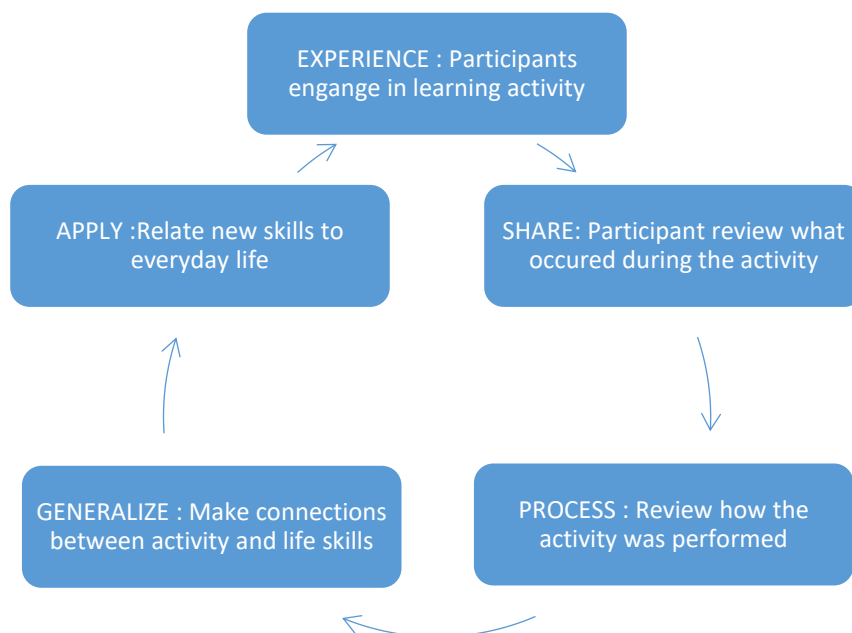
## METHODS

The materials used in this community service activity were selected to ensure environmental sustainability, technical effectiveness, and ease of replication by local communities. Mangrove leaves, collected sustainably from the surrounding coastal area, were used as the primary source of natural dyes due to their tannin content and availability in the local ecosystem (KLHK, 2020; Wibowo & Lestari, 2022). Cotton fabric was chosen as the main textile material because of its high absorbency and compatibility with plant-based dyes, resulting in better color fixation (Putri & Santoso, 2020).

To improve dye durability, alum (potassium aluminum sulfate) was used as a natural mordant, as it is considered environmentally safer than synthetic alternatives and commonly applied in eco-friendly batik production (Suparmoko, 2019). The resist-dyeing process utilized wax (malam) applied with traditional canting tools, while stainless steel containers and portable stoves were used to prevent unwanted chemical reactions during dyeing. Overall, all materials were affordable, locally accessible, and suitable for sustainable community-based production.

The integration of participatory approaches with experiential learning is particularly effective in coastal and rural community settings, as it encourages collective problem-solving, contextual learning, and local ownership of innovation processes. Previous community service studies report that such approaches significantly improve participants' adaptive capacity and sustainability of post-training initiatives (Setiawan et al., 2021; Widodo & Lestari, 2020).

The implementation stages consisted of several sequential activities. Needs assessment and socialization were conducted through initial observations, informal interviews, and group discussions to identify community needs, existing skills, and local resource availability, which is a core principle of participatory rural development (Chambers, 2014). Green economy literacy training was then delivered to introduce participants to sustainable resource management, green economy concepts, and basic micro-enterprise strategies relevant to coastal communities (UNEP, 2011; Bappenas, 2021).



**Figure 2.** PKM activity stages

Subsequently, **hands-on batik production training** was implemented using experiential learning principles, allowing participants to directly practice natural dye extraction from mangrove leaves, fabric preparation, dyeing techniques, and product finishing. Experiential learning has been proven effective in enhancing technical skills and knowledge retention in community-based training (Kolb, 2015). **Group discussions and reflective sessions** facilitated experience sharing and collective problem-solving, while

**evaluation and mentoring** were conducted through participant feedback and observation to support post-training implementation and business continuity.

Overall, this approach aligns with participatory rural development principles, emphasizing learning-by-doing, empowerment, and community-based innovation.

**Result**

**Table 2.** Renspons after join the training programs

	I understand the concept of the green economy and the use of local resources after participating in this training program.	This training program has improved my skills in producing environmentally friendly products (e.g., batik using mangrove-based natural dyes).	The training materials and methods were easy to understand and appropriate for the needs of the community.	I am motivated to develop a green economy-based business or economic activity after participating in this program.
Strongly Disagree	0	0	0	0
Disagree	0	0	0	0
Neutral	4	2	4	0
Agree	10	7	8	12
Strongly Agree	16	21	18	18
Sorcoe: 30 Respondent, 2026				

Beyond the immediate improvement in knowledge and technical skills, the outcomes of this community service program indicate a broader transformation in participants’ attitudes toward sustainable livelihoods. Increased understanding of green economy principles enabled participants to recognize the linkage between environmental conservation and economic value creation, particularly through the sustainable use of mangrove resources. Similar findings have been reported in community-based green economy initiatives, where environmental literacy plays a crucial role in shaping pro-environmental behavior and entrepreneurial orientation among coastal communities (UNEP, 2011; Bappenas, 2021).

Several studies emphasize that economic vulnerability in coastal communities is closely linked to limited livelihood diversification and the marginal economic role of women. Empowerment programs that focus on skill development and utilization of local resources have been shown to increase household income stability and women’s economic participation (Sari et al., 2021; Yulianti & Prasetyo, 2022). Furthermore, integrating environmental sustainability into community-based economic activities strengthens long-term resilience by aligning income generation with ecosystem conservation (Rahmawati et al., 2020).

**DISCUSSION**

The successful production of batik using mangrove-based natural dyes demonstrates the effectiveness of experiential learning in transferring practical skills. Learning-by-doing approaches have been shown to significantly improve skill retention and self-efficacy among adult learners in community empowerment programs (Kolb, 2015; Palenti, 2021). In this program, participants not only acquired technical dyeing skills but also developed confidence to explore eco-friendly product innovation, which is a key factor in sustaining micro-enterprise development (Wibowo & Lestari, 2022).

Behavioral changes observed during and after the intervention—such as increased environmental awareness and interest in eco-friendly product development—are consistent with previous studies on participatory empowerment in coastal areas (Mallapiang et al., 2020; Cahyaningrum et al., 2025). Compared to similar empowerment programs, this activity demonstrates a distinctive advantage by integrating ecological preservation with economic incentives, thereby aligning conservation goals with household income generation (Nalhadi et al., 2020; Putri & Santoso, 2020).

Similar challenges related to production scale and market access have been widely reported in community-based creative industries. Studies indicate that without structured institutional support and market linkage facilitation, micro-scale green enterprises often struggle to scale up production despite improved technical capacity (Pratiwi et al., 2022). Therefore, follow-up programs involving cooperative development, digital marketing assistance, and cross-sector partnerships are critical to enhancing the economic impact of community empowerment initiatives.

In addition to technical capacity, access to market information and digital platforms plays a critical role in determining the sustainability of community-based micro-enterprises. Several studies highlight that the adoption of simple digital marketing strategies significantly enhances product visibility, expands market reach, and increases income opportunities for coastal and rural communities (Suhartini et al., 2021). Therefore, integrating digital marketing literacy into future community service programs is expected to complement skill-based training and strengthen the long-term economic impact of green economy initiatives.

Nevertheless, the program faced limitations related to production scale and market access, which are common challenges in early-stage community-based enterprises (Harefa et al., 2023). Limited capital, simple production tools, and lack of marketing networks constrain the ability of participants to expand beyond small-batch production. Therefore, continuous mentoring, institutional collaboration, and support for digital marketing adoption are essential to enhance scalability and long-term impact. Previous studies emphasize that sustained accompaniment and multi-stakeholder collaboration significantly improve the durability of community empowerment outcomes (Chambers, 2014; Bappenas, 2021).

**Table 3.** Mapping of Problems, Solutions, and Outputs in Coastal Community Empowerment

Problem	Solution	Output
Limited economic diversification of coastal households, with income highly dependent on fish catches	Green economy literacy training and introduction of alternative livelihood concepts based on local resources	Increased awareness of alternative income opportunities beyond fishing activities
Low participation of women in productive economic activities	Skills-based training focused on women empowerment through batik production using mangrove-based natural dyes	Improved technical skills and active involvement of women in eco-friendly production activities
Limited knowledge of sustainable resource utilization	Training on sustainable mangrove utilization and environmentally friendly production processes	Increased understanding of environmental conservation and sustainable production practices
Lack of practical skills in value-added product creation	Hands-on batik production training using experiential learning methods	Production of batik fabrics with natural mangrove dyes as tangible training outputs
Weak entrepreneurial and business management capacity	Basic training on small-scale business strategies, pricing, and product development	Improved confidence and readiness to initiate micro-scale green enterprises
Limited access to markets and promotion channels	Group discussions and mentoring on potential market access and digital marketing strategies	Increased motivation to explore market opportunities and future adoption of digital marketing

## CONCLUSION

This community service program successfully implemented green economy literacy and batik production training using mangrove-based natural dyes in a coastal community. The activity enhanced participants' knowledge, skills, and environmental awareness while creating economic opportunities. Despite limitations in scale and market access, the program demonstrates a replicable model for sustainable community empowerment. Future activities should focus on business scaling, digital marketing, and stronger institutional partnerships. Furthermore, this program underscores the importance of integrating capacity building with long-term sustainability strategies in community empowerment initiatives. Future

efforts should not only emphasize skill enhancement but also prioritize strengthening institutional support, improving access to capital, and expanding market linkages through digital platforms. By fostering collaboration among local governments, academic institutions, and private sectors, the scalability and impact of green economy-based initiatives can be significantly enhanced. Ultimately, a holistic approach that combines environmental conservation, economic innovation, and continuous mentoring will be crucial in ensuring the sustainability and resilience of coastal communities in the long term.

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