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## Development of Madura Batik MSME HR as a Catalyst for Green Entrepreneurship in Indonesia

Akh. Fawaid<sup>1\*</sup>, Sudarmiati<sup>2</sup>, Wening Patmi Rahayu<sup>3</sup>

<sup>1</sup>Universitas Negeri Malang, Indonesia

<sup>1</sup>STIE Bakti Bangsa, Pamekasan, Indonesia

<sup>2</sup>Universitas Negeri Malang, Indonesia

<sup>3</sup>Universitas Negeri Malang, Indonesia

Email : [akh.fawaid.2404139@students.um.ac.id](mailto:akh.fawaid.2404139@students.um.ac.id), [akhfawaid1@gmail.com](mailto:akhfawaid1@gmail.com)<sup>1</sup>  
[sudarmiati.fe@um.ac.id](mailto:sudarmiati.fe@um.ac.id)<sup>2</sup>, [wening.patmi.fe@um.ac.id](mailto:wening.patmi.fe@um.ac.id)<sup>3</sup>

**Abstract.** *The purpose of this study is to look at how human resource (HR) development in Batik Madura micro, small, and medium-sized enterprises (MSMEs) might act as a catalyst for green entrepreneurship in Indonesia. Green entrepreneurship is becoming the primary emphasis for decreasing negative environmental consequences while enhancing competitiveness in a global market that is more concerned with sustainability. HR plays a crucial role in implementing technical innovation and environmentally sustainable industrial processes. This study takes a qualitative method, with in-depth interviews with the owners, managers, and employees of MSME Batik Madura, as well as a literature analysis on green entrepreneurship. According to the study's findings, sustainable human resource development through training and education that emphasizes sustainability can boost productivity and efficiency in batik manufacturing. Furthermore, human resources with environmental consciousness and digital marketing abilities help Madurese batik products compete more effectively in national and international marketplaces. This study promotes collaboration among government, academics, and industry stakeholders to strengthen the development of human resources for Madura Batik MSMEs, which is the primary pillar in the transition to green entrepreneurship.*

**Kata kunci:** *HR Development, Green Entrepreneurship, Madura Batik MSMEs,*

### 1. BACKGROUND

The Madurese batik industry is a key sector that not only provides economic benefits to local people, but also contributes significantly to the preservation of Indonesian cultural heritage. Amid the obstacles of modernization, this industry must remain relevant in an increasingly competitive worldwide market. One strategy to maintaining and increasing the competitiveness of the Madura batik sector is to implement the concept of green entrepreneurship, often known as environmentally friendly entrepreneurship. Human resource (HR) development in this industry is critical for the transition to more sustainable entrepreneurship. Environmental issues have recently emerged as a serious concern in a variety of economic sectors, including artistic industries like batik. Batik production, particularly those that continue to employ chemicals in the dyeing process, has the potential to harm the environment if not controlled appropriately.

As a result, the development of environmentally friendly technologies and raising environmental consciousness among industry participants is critical. Human resource development is critical in this scenario because it serves as a catalyst for the adoption and implementation of sustainable practices.

Human resource development in the Madurese batik industry presents unique problems, as the bulk of MSMEs in this sector continue to function traditionally. Continuous education and training are required to ensure that batik workers and craftsmen understand the significance of green entrepreneurship and how it may be utilized in daily life. This training covers not only technical concerns, such as the use of natural dyes and waste management, but also managerial aspects, such as marketing strategies for environmentally friendly products that can appeal to the worldwide market. The concept of "green entrepreneurship", also known as "greenpreneurship" (Prayitno et al., 2020), has evolved as a result of some researchers' greater focus on the relationship between green development and entrepreneurship.

Aside from that, changes in consumer behavior, which are becoming increasingly concerned with eco-friendly products, present an excellent chance for Madurese batik MSMEs to develop products that are not only of high quality, but also have added value in terms of sustainability. With the growing demand for ecologically friendly products, Madura's batik MSMEs have an opportunity to boost their international sales. However, this requires people resources with green entrepreneurship skills and knowledge.

Human resource development also includes the ability to innovate during the production process. Environmentally friendly improvements, such as the use of energy-saving technology, more effective water management, and natural materials in batik manufacturing, can all be strategic moves toward reducing negative environmental impacts. Aside from that, innovation in product design and diversification is required so that Madura batik is recognized as a modern and environmentally beneficial product, as well as a traditional one.

On the other hand, human resource development that promotes green entrepreneurship is critical in promotion and marketing initiatives. In today's digital age, the capacity to market things through digital technology and online platforms is critical. Madurese batik MSMEs with digital marketing abilities will be better positioned to compete in the global market, particularly if they use sustainable and environmentally friendly product narratives as their key selling point.

The government and other institutions play a role in promoting human resource development in this industry. Training programs, whether run by the government or private organizations, can offer Madurese batik industry actors with the information and skills they need to pursue green entrepreneurship. Aside from that, providing incentives for MSMEs that effectively employ environmentally friendly practices may motivate more business players to follow suit.

One of the most significant hurdles in developing human resources for green entrepreneurship in the Madurese batik industry is inadequate access to technology and information. Many MSMEs continue to operate in rural locations, with limited access to the internet and educational resources. As a result, concerted initiatives from the government, corporate sector, and academia are required to increase access to environmentally friendly training and technologies.

Success in strengthening human resources to foster green entrepreneurship will benefit both Madurese batik MSMEs and the larger society. By implementing cleaner and more sustainable manufacturing processes, the Madurese batik sector can reduce negative environmental impacts such as water and soil contamination caused by the use of chemicals in the dyeing process.

Human resource development can also help to solve social issues, such as enhancing worker welfare. Batik workers can boost their productivity and revenue by learning new skills related to global trends. Furthermore, the batik industry's long-term viability will help to maintain local economic stability, particularly in the Madura region, where many people rely on this sector for a living.

The concept of green entrepreneurship is also consistent with global efforts to accomplish the SDGs. Madurese batik MSMEs can help achieve SDG targets by creating human resources that promote sustainable practices, particularly in terms of responsible production and consumption, as well as poverty eradication through local economic strengthening.

Aside from that, integrating green entrepreneurship in the Madurese batik business has the potential to boost Indonesia's global image. Batik, as one of UNESCO's intangible cultural heritages, has the potential to be an outstanding export commodity.

By integrating traditional values with environmentally friendly innovation, Madurese batik has the potential to become a cultural product that is both sustainable and competitive in the global market.

Long-term, human resource development that promotes green entrepreneurship can lead to increased product variety. Sustainable batik MSMEs can explore new prospects in design and the use of environmentally friendly local materials. This diversification will not only increase market share, but will also boost the batik industry's resistance to global market shifts.

Human resource development also necessitates a comprehensive approach in which training focuses not just on technical abilities but also on developing soft skills such as leadership, creativity, and the ability to adapt. Human resources with these soft skills will be

better equipped to manage changes in the batik business and implement new, more successful tactics.

Finally, the success of human resource development in the Madurese batik sector will rely heavily on collaboration among many parties. Government, academia, the corporate sector, and local communities must collaborate to provide the resources required to promote the adoption of green entrepreneurship. With effective collaboration, Madura batik MSMEs will not only survive in an increasingly competitive period, but will also emerge as pioneers in green entrepreneurship in Indonesia.

Aside from that, the significance of local community organizations in promoting human resource development in this area cannot be overlooked. Community organizations can serve as a liaison between the government and MSMEs by offering information, training, and technical assistance. They can also help to raise awareness of the benefits of green entrepreneurship among Madura's batik industry players.

In this perspective, green entrepreneurship is viewed not just as a corporate strategy, but also as a way to promoting social and environmental sustainability. With competent human resources dedicated to sustainable values, Madurese batik MSMEs can evolve into business actors who are not only economically successful but also have a beneficial impact on the environment and society. Thus, increasing human resources in Madura batik MSMEs as a catalyst for green entrepreneurship is an important strategic step that must be fully supported. Through education, training, and collaboration among diverse stakeholders, the Madurese batik sector may continue to grow sustainably, protecting the environment while giving economic advantages to local people.

(Wulansari et al., 2020) in their study on HR planning techniques for boosting the competitiveness of Semarang Batik MSMEs mentioned that source quality Good human resources (HR) practices have a direct impact on business management. HR quality may improve operational efficiency and effectiveness, making MSMEs more competitive in the market. Purnomo et al. (2022) conducted research on the processing of batik dye waste in Klampar Village, Proppo District, Pamekasan Regency using superadsorption. Adsorbent identifies challenges encountered by batik craftspeople while disposing of synthetic dye waste, which has the potential to contaminate the environment, including water supplies and agricultural land. This research also includes the development and implementation of reactor technology decolorization to treat waste and make it safer for disposal. In other research. According to research (Wijaya et al., 2022), high environmental knowledge increases MSME players' understanding of environmental challenges and the relevance of sustainability.

Understanding the detrimental effects of hostile business operations on the environment increases the likelihood that MSME actors will change their perspectives and recognize the value of implementing green economic practices. Adequate knowledge of the green economy enables MSMEs to appreciate the long-term benefits of implementing environmentally friendly practices, such as lower operational costs through improved energy efficiency and waste management. This can shift their opinion of green practices as a profitable investment.

The approach used in this study is unusual because it combines two essential concepts: HR concentrating on environmental skills and environmentally friendly business. Human resources as a catalyst of transformation to sustainable practices is still understudied, particularly in creative sectors like batik.

Although there has been a lot of research on green entrepreneurship in many sectors, there is relatively little research on Madurese batik MSMEs and green entrepreneurship implementation. Madura batik has distinct cultural and manufacturing characteristics, therefore this study contributes to the literature by providing specific case studies from the Madura region. This offers new insights into how MSMEs in certain regions might adapt to the concept of green entrepreneurship.

This study aims to bridge the gap between traditional products (Madurese batik) and the demands of the global market, which is increasingly concerned with ecologically responsible options. The originality of this study is demonstrated by how human resources in batik MSMEs may be a driving force in adapting traditional products to global trends. This element makes a distinctive contribution to the study of green entrepreneurship by emphasizing the significance of understanding worldwide markets and sustainability-based branding strategies.

## **2. THEORETICAL STUDY**

Human resource development is an ongoing endeavor to enhance the overall quality of human resources by education, training, and coaching. Silalahi, 2000 (Kasmawati, 2019). Human resource development is also an effective technique for overcoming numerous obstacles, such as lagging or outmoded personnel competencies, as well as responding to workforce diversification on a domestic and worldwide scale.

HR development can be defined as a systematic and planned collection of actions meant to provide employees with the skills they need to meet job needs today and in the future. Harrish and Desimone, 1998:2 (Nun Tufa, 2018) Human resource development is related to the availability of learning opportunities and development, designing training programs that

include planning, implementing, and evaluating these programs. (Armstrong, 1997:504 in Nun Tufa, 2018; Tubagus, 2015:83 in Nun Tufa, 2018). Individual development is defined as the preparation of individuals to take on new tasks or move up in enterprises, organizations, institutions, or educational institutions.

According to Nun Tufa (2018), human resource development is more philosophical and theoretical in nature than training. Managers are typically the center of development, whilst non-manager personnel are the target of training programs. Despite their distinctions, both development and training seek to enhance skills and capacities.

Green entrepreneurship is intimately tied to green innovation, and organizations that follow green entrepreneurship principles may not be skilled in attaining green innovation; green innovation requires more effort than traditional innovation (Skordoulis et al., 2022). From this perspective, (Soomro et al., 2024) investigated the relationship between green innovation and green entrepreneurship in their study and discovered a statistically significant relationship between green innovation and economic success, after controlling for the influence of green entrepreneurship.

Studies This suggests that implementing green entrepreneurship can help businesses enhance their financial performance. Furthermore, green entrepreneurship is considered a successful and innovative endeavor that has a positive impact on local communities, regional economies, and the surrounding environment (Speckemeier & Tsivrikos, 2022).

Green entrepreneurship can be characterized as start-up enterprises that began out in the environmental services or production industry, focusing on natural resources or natural conditions, such as ecotourism, recycling, waste water treatment, and biodiversity. Nikolaou et al. (2011) in Rahmawati (2009). new paradigm of production and consumption of green products and services, eventually demanding 'green' entrepreneurship in the market (Farinelli et al., 2011). MSMEs (Micro, Small, and Medium Enterprises) play a vital role in Indonesia's economy, particularly in culturally rich places like Madura. One of Madura's best goods is batik, which has a distinct and unique pattern. According to Sekartaji Suminto's research, Madura written batik became widely known between the 16th and 17th centuries. (suminto, 2015). At the time, there was a conflict in Pamekasan Regency between Raden Azhar (Kiai Penghulu Bagandan) and Ke' Lesap. Raden Azhar serves as the spiritual counselor to Raden Ismail, Duke of Pamekasan. Meanwhile, Ke' Lesap is a Madurese son who descends from Cakraningrat I.

Madurese batik art is estimated to have existed since 1293, and it persisted until the 17th century. At the time, Ario Prabuwinoko reigned the Sumenep kingdom on the salt island. This

duke established Madurese batik as an ancestral tradition, distinguishing it from the various Javanese batik ([disperindag.jatimprov.go.id](http://disperindag.jatimprov.go.id)). Madura batik is well-known for its cultural and aesthetic significance, which is evident in every design and color produced. However, as industrial advances and market demand shift, Madura Batik MSMEs face a variety of problems, particularly in terms of competitiveness and commercial objectives.

Madura has a considerable number of MSMEs involved in batik manufacture. Pamekasan Regency has the most batik centers among Madura's four regencies, out of the other three districts. The district's hand-written batik craftsmen are scattered among 38 batik centers, totaling 933 business units and 6,526 people who rely on this sort of creative industry for their livelihood.

Pamekasan Regency Government Industry and Trade Service data shows that there are 38 batik centers. This figure is split among 11 sub-districts in Pamekasan. Each Pamekasan District has five Batik Centers. Batik centers at Kowel Village, Toronan Hamlet Batik, Nyalabu Daya Village Batik, and Gladak Anyar Village have all been noted. Pamekasan Regency has a total of 1,671 batik craftsmen.

With growing global concern about environmental issues, the batik sector cannot avoid the demand to become more environmentally friendly. Many consumers, particularly in international markets, now want products made with environmental considerations in mind. This highlights the necessity for Madura Batik MSMEs to implement measures that promote natural sustainability in order to maintain product sustainability in an increasingly eco-conscious market.

### **3. RESEARCH METHODS**

This research method employs descriptive qualitative. The Ecoprint batik MSME actor Syamila\_ecoprint is based in Tobungan Village, Galis, Tobungan District, Galis, Pamekasan Regency. This investigation lasted seven months, from June to September 2024.

In this study, researchers used a variety of data collection techniques, including observation, interviews, documentation, and literature review. a.Observation is a data gathering approach in which researchers record information while conducting study (Gulo, W, 2003:116). Observation data consists of realistic, accurate, and detailed descriptions of the field, humanitarian actions, and social problems, as well as the locations where these activities take place. Observations were conducted to determine the activities of Batik MSMEs, which included batik business owners and staff at the research object.

During the research, the researcher remained outside the topic (non-participant), observing but not participating in the activities or activities carried out by Batik MSMEs, both those engaged in ecoprint batik production and Madurese batik MSMEs, as research objects. That was observed. Researchers make their observations publicly. So they freely allow researchers to witness the events that occur.

The following technique is the interview technique. Data collecting method consists of asking an informant or respondent a question. The interview technique utilized in this study is a free guided interview, in which the questions are not connected to the interview guide and can be expanded or refined based on the circumstances and conditions in the field. Documentation Documentation is a technique for collecting data from research subjects. Documentation in this study focuses on gathering supporting documentation for the relevant research data. For this study, documentation of batik activities is necessary, including the process of Madura written batik using the traditional procedure and written batik using the ecoprint process.

Literature study is a data collection approach that involves studying literature in libraries and collecting books, journals, written materials, and references that are relevant to the research being conducted. A literature review is also a significant component of research efforts since it can provide information on MSME actors in the batik industry.

This analysis method is comprised of four components, including: Data acquisition. Data gathered through observations, interviews, and documentation are preserved in field notes, which include two components: description and reflection. Descriptive notes are natural data that record what the researcher saw, heard, felt, witnessed, and experienced without the researcher's viewpoint or interpretation of the occurrences encountered. Reflection notes are notes that contain the researcher's opinions, remarks, and interpretations of the discoveries discovered, as well as information for future data gathering plans.

Data collecting for research on the development of Madurese batik MSME human resources as a catalyst for green entrepreneurship in Indonesia was completed in stages. The first stage was to observe and interview batik MSMEs, including those producing batik ecoprints in Tobungan Village, Galis, and traditional written batik in Pagendingan, Galis, Pamekasan Regency. Then take notes on the parts that are thought to be pertinent to the core problem. The next step is to photograph the activities of Batik MSMEs, which include batik business owners and workers at Madura's hand-written batik centers.

Data reduction is an activity in which researchers do study with the goal of simplifying and abstracting research data. Researchers choose relevant and useful data to offer by picking



basic or core data, focusing on data that leads to issue solutions, and selecting data that can answer research questions. Data reduction in this study was accomplished through coding. Coding is performed with the goal of selecting data. In this study, interviews were performed with Batik MSME actors, including batik business owners and workers, to learn about the potential for ecoprint integration in Madura batik firms through the transformation of batik business management. If there is data that does not match the discussion in this study, the researcher will dismiss it. Aside from that, the researcher compiled a summary of the batik MSME players and deleted any irrelevant information to get a more concentrated image of the research issue.

Data presentation is a systematic collection of information that allows for the drawing of conclusions and subsequent action. Researchers can comprehend what is going on and what has to be done next by reviewing the data presentation. facts presentation tends to reduce complex facts to a basic and selective form that is easier to understand. The data presentation in this research was carried out by compiling information about the activities carried out by Madurese batik MSME actors, so that the data that is ready to be presented is data that is related to or in accordance with the research focus regarding the development of Madurese batik MSME human resources as a green catalyst. entrepreneurship in Indonesia.

#### **4. RESULTS AND DISCUSSIONS**

UMKM Batik Syamila\_Ecoprint is located in Tengger Hamlet, District. Tobungan, Galis Pamekasan Regency, is one of the batik business actors dedicated to executing the concept of green entrepreneurship through ecoprint innovation. Ecoprint is a fabric dyeing technique that employs natural materials such as leaves, flowers, and twigs to produce organic, eco-friendly designs. This MSME is an intriguing example of how human resource (HR) development can help support the implementation of green entrepreneurship, particularly in the batik industry.

Syamila\_ecoprint's human resource development focuses on teaching employees to adopt eco-friendly printing procedures. Workers are taught how to turn natural ingredients into fabric colors that are not only environmentally friendly, but also make high-quality products. Interviews with the owner reveal that this training has helped personnel appreciate the necessity of environmental preservation through their employment.

Observations in the field demonstrate that the ecoprint batik production method at Syamila\_ecoprint prioritizes the use of materials readily available from the natural environment. For example, leaves from the village's trees are utilized as natural dyes and then

applied to fabric to create unique motifs. This procedure differs from traditional batik processes, which frequently employ synthetic dyes that can harm the environment. Thus, this ecoprint technology not only eliminates negative environmental repercussions, but also improves the aesthetics of the batik goods created.

Green entrepreneurship highlights the value of striking a balance between economic growth and environmental sustainability. In the instance of Syamila\_ecoprint, the use of ecoprint as an environmentally friendly production technology is a concrete example of green entrepreneurship. By using natural components, these MSMEs have been able to reduce negative environmental consequences while generating products that add value in the eyes of customers.

The findings of this study are also consistent with prior research, which found that human resource development plays a vital role in the adoption of environmentally friendly technologies. Rahman (2020) and Sukmawati (2021) found that worker training can promote the adoption of more environmentally friendly industrial techniques. In the context of this study, the ecoprint training provided to Syamila\_ecoprint employees supports these findings.

However, the findings of this study indicate that there are various hurdles that other MSMEs may not have encountered in earlier research. One of the challenges for Syamila\_ecoprint is the financial limits that prevent them from obtaining significant amounts of natural components. Despite these challenges, this MSME was able to overcome them by employing local resources available in Polagan Village, Kec. Galis, Pamekasan Regency, as well as cooperating with local communities to secure material supplies.

One of the most significant obstacles faced by Syamila\_ecoprint in developing human resources is a lack of access to modern technologies and adequate financial resources. Despite having received ecoprinting instruction, adopting this technique takes more time and resources than traditional batik procedures. MSME owners noted that in order to preserve product quality, they must continue to develop using natural components, which can be difficult to find in big amounts in the Galis District market. However, sustained human resource development in MSMEs has been shown to improve productivity and product quality. Workers who receive thorough training are not only able to manufacture high-quality ecoprint batik, but they also have a better understanding of the need of maintaining a balance between production and environmental impact. This is consistent with the concept of green entrepreneurship, which makes environmental sustainability an inherent element of the business strategy.

In terms of marketing, UMKM Batik Ecoprint Syamila\_ecoprint has endeavored to integrate digital technologies into its human resource development strategy. Workers receive basic digital marketing training, including how to utilize social media to sell their products. Aside from that, MSME owners are aggressively seeking new markets via e-commerce platforms, which allow their ecoprint batik products to reach consumers outside of the Pamekasan area, including international markets. However, there are various impediments to using digital technology in MSMEs. Some employees still struggle to adapt to new technology, particularly when it comes to using e-commerce platforms. This demonstrates that human resource development must not only focus on developing technical abilities in production, but also on digital literacy, in order to capitalize on opportunities in the contemporary digital age.

In terms of sustainability, the ecoprint batik produced by Syamila\_ecoprint adds great value, particularly in markets that value environmentally friendly products. This ecoprint batik product from MSMEs has gotten positive feedback from a variety of groups, including local customers. The items are regarded distinctive since the themes created from natural materials are never the same, giving each product its own distinct characteristics.

Syamila\_ecoprint also strives to strike a balance between environmental sustainability and economic development. MSME owners understand that, while ecoprint batik production is more environmentally beneficial, it incurs higher production costs because to the greater usage of natural raw materials. As a result, the product costs more than conventional batik. However, people that care about the environment are willing to pay more for high-quality, ecologically friendly products.

To maintain business sustainability, Syamila\_ecoprint works closely with local governments and community organizations to provide additional worker training. This program covers several facets of green entrepreneurship, including production waste management, the utilization of sustainable raw materials, and environmentally friendly corporate management. This stage helps MSMEs build their human resource capability so that they may continue to innovate and adapt to changes in the batik industry. Aside from that, Syamila\_ecoprint participates in community events that promote environmental protection. This MSME frequently holds ecoprint seminars or demonstrations in schools and communities to raise awareness about the need of environmental protection. This activity not only helps to introduce their products, but it also contributes to public awareness of sustainability.

From a management standpoint, the proprietor of Syamila\_ecoprint understands the value of human resource development that is integrated into long-term business strategy. As a result, they concentrate on building worker skills that are relevant to market trends, such as inventive design abilities and ever-changing natural dyeing procedures. In this method, MSMEs may ensure their competitiveness and relevance in an ever-changing market.

Syamila\_ecoprint also takes steps to ensure the quality of the products it produces. One of the actions taken was to implement tight quality control at all stages of production. Workers are trained to thoroughly inspect the ecoprint results before the product is launched. This helps to ensure that the products that reach customers fulfill market expectations, particularly those who like premium products.

Syamila\_ecoprint uses social media to share the story of their ecoprint batik production process, including how natural materials are chosen and eco-friendly dying procedures are used. This has piqued the interest of consumers who are increasingly interested about the sources of the things they purchase.

Overall, the research findings indicate that Syamila\_ecoprint MSMEs were successful in creating human resources to support the implementation of green entrepreneurship. Despite ongoing hurdles, particularly in terms of financial resources and adaptation to digital technologies, these MSMEs have demonstrated that, with the appropriate approach, human resource development can be the key to success in generating long-term business growth.

The conversation on human resource development at Syamila\_ecoprint demonstrates that innovation is required not just in terms of products, but also in management and marketing. The utilization of natural materials and ecoprint techniques not only boosts product value, but also allows these MSMEs to penetrate new environmentally conscious market groups. This demonstrates that batik MSMEs, particularly those focused on green entrepreneurship, have a high potential for growth if backed by talented and inventive human resources.

Thus, human resource development at Syamila\_ecoprint has succeeded in serving as a catalyst for green entrepreneurship in the Madura batik industry. The business model they use can serve as an example for other MSMEs looking to implement environmentally friendly and sustainable practices.

## 5. CONCLUSION AND RECOMMENDATIONS

The findings of this study indicate that human resource development in Batik Syamila\_Ecoprint MSMEs has an important role in supporting the adoption of green entrepreneurship techniques. Workers who were trained in ecoprint processes and the use of natural materials saw an increase in productivity, product quality, and environmental consciousness. This rise not only improves MSMEs' overall performance, but it also results in products with extra market value because they are ecologically sustainable. External support from government agencies and non-governmental organizations also helps to increase the adoption of green entrepreneurship, particularly by providing training and market access.

The scope of this study is limited to one MSME, hence the findings may not be applicable to all batik MSMEs in Indonesia. As a result, additional study involving more MSMEs is required to discover broad patterns in human resource development and the use of green entrepreneurship in varied situations. Recommendations include establishing cooperation networks between MSMEs and supporting institutions, as well as fostering continual training, to promote more sustainable company transformation. Further research is also required to investigate the financial and technological aspects of promoting green entrepreneurship in the MSME sector.

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