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Implementation of Eco-print Batik Steamer Machine to Optimize the Color Transfer Process in SME Fabric

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Abstract: Daun Efek is a Small Medium Enterprises in Sidoarjo which is engaged in the production of eco-print batik cloth. In making eco-print batik, UKM Daun Efek still uses conventional methods, thus causing the limited amount of production produced. Other constraints faced are the lack of attractive product packaging and lack of widespread marketing, so that turnover is difficult to increase due to lack of consumer reach. This activity uses an implementation method through a participatory approach, including such as FGDs, training and mentoring as well as discussion activities to exchange experiences between the proposing team and partners. From the implementation method that implemented, a grant machine was produced in the form of an eco-print batik steamer machine, which is able to increase the amount of production from 6 sheets of batik cloth per day to 18 pieces of batik cloth per day. In addition to production management, there was also improved the quality of product packaging from simple and unattractive to a packaging that has good, creative, and imprinted elements in the eyes of consumers through green box-shaped packaging with the partner logo. The reach of consumers has become wider with the marketing through social media.

Keywords: batik; eco-print; steamer

INTRODUCTION

SMEs (Micro, Small and Medium Enterprises) in Indonesia play a crucial role in driving economic growth. Over the past decade, the number of SMEs has increased by 4.2% annually between 2016-2019. In addition, the average contribution of SMEs to Indonesia's Gross Domestic Product (GDP) in the last three years has exceeded 50% (Soetjipto, 2020). This shows that SMEs have the capability to strengthen the economic sector independently and accelerate economic growth in Indonesia. Some SMEs, especially those that focus on Indonesian cultural heritage such as handicrafts and batik, have the potential to compete globally and generate significant export value.

According to Darsono, S & Muchtar (2018) batik is the art of creating motifs on fabric by using wax or night as a barrier during the dyeing process. In traditional batik, patterns or images are made manually by freehand using stamping, writing, or a combination of both. One of the methods in the process of making batik is carried out by tracing teak leaves, guava, ketepeng, talok, hibiscus, leaves, and flowers, then boiling them. This approach is often referred to as eco-print batik.

This method is used by Daun Effect UKM, Sidoarjo. Based on observations between the proposing team and the owner of the Daun Effect UKM, the UKM that produces approximately 6 pieces of batik cloth per day with a turnover of around Rp.20,000,000 per month turned out to have several problems after observation. These problems include obstacles in increasing production due to the lack of production support equipment and the production process is still conventional, the lack of production support tools in the form of eco-print batik cooking pots and affects production time and worker effectiveness, marketing that has not expanded and it is difficult to increase the number of customers, and Daun Effect SMEs still use fairly simple packaging so that it is less attractive Consumer Interest.

Of the various problems that exist, of course, there is a need for solutions to improve aspects of production management, marketing management, and thinking skills in improving production capabilities both in terms of hard skills and soft skills. The formulation of the problem in this activity is as follows: 1) How to improve the aspects of production management and marketing management? 2) How to improve thinking skills in improving production capabilities? The objectives of the implementation of this activity are as follows: 1) Improving the aspect of production management for production capabilities and marketing management so that products can be known more widely so that it is hoped that Daun Efek SMEs can develop and revenue streams, 2) Improving thinking skills in improving production capabilities and hard skills training regarding tools to be used for partners, and soft skills for product packaging and product promotion.



Figure 1. SME location points via google maps

METHODOLOGY

The implementation method is carried out through a participatory approach such as FGD, training and mentoring as well as discussion activities to exchange experiences between the proposing team and partners. The following is the draft of the implementation method flow.:



Figure 2. Flow of activity implementation

1. Socialization and Survey

Conduct socialization, initial surveys and initial interviews by the proposing team with Daun Efek SME owners, as well as inform about Research and Community Service to Daun Efek SME partners.

2. Planning Service Activities

Taking documentation, analyzing data from the results of the survey and interview phase 1, forming a team of proposers and team assistants, coordinating between members for the

preparation of proposals, preparing the required letters, finalizing and sending proposals, and carrying out activities.

3. Design Stage, Tool and Material Requirements, Manufacturing, and Assembly

Designing the "ECO-PRINT BATIK STEAMER" machine was followed by the manufacturing process and *machine assembly*.

4. Training, Mentoring, and Technology Application

Providing training and assistance to partners related to the program of activities launched.

5. Application and Handover of Machines to Daun Efek SME Partners

Applying the "ECOPRINT BATIK STEAMER" machine to partners.

6. Mentoring and Evaluation

Monitoring and evaluating the benefits of the "ECOPRINT BATIK STEAMER" machine to anticipate problems that occur in the future.

RESULTS AND DISCUSSION

Design of Tools and Materials

In the design of the "ECOPRINT BATIK STEAMER" machine using the following tools and materials:

Tool:

- 1. 6, 8, 10 and 12 nachi drill bits as well as impact wrenches.
- 2. Wipe microfiber 30 cm x 30 cm and 60 cm x 60 cm.
- 3. Thermocouple type K SS 304 schedule 40, timer Omron H5CN-XBN 100-240VAC, dan manometer.
- 4. Iron scissors, hacksaws, elbow rulers, and M12 hard needles.
- 5. Low pressure stove 2 burners.
- 6. Bending machine, drilling machine, sponge sharpener, flat sanding and face stacking grinder, steel brush, SMAW electric welding machine, TIG welding machine, right left alignment tool holder, wire soldering, paint gun sprayer, collet arbor lock set, torch handle, and TK4L-24CN autonics
- 7. Langsol green polish.

Material:

- Stainless blind rivet, hollow stainless 201 30x30x1, hollow stainless 201 20x20x1, plat stainless 304 1 mm
- 2. 1/4 valve, solenoid valve, 1/2 in hose clamp, gas hose, 1/4 drat 5/8 hose nipple, weld clamp timing clamp, and cable.
- 3. Coolant, gas argon, gas hose, degreaser, dan anti spatter.
- 4. Stainless elbows, magnetic elbows, compounds, and 1/4 elbows, panel boxes.
- 5. Cut grinding stones, 5 in sharpening stones, and grinding brushes.
- 6. Stainless welding wire, rubber gaskets, castor wheels, and plain white cotton fabric.
- 7. SSR-75 DA-H/SSR 75 DA-H/SOLID STATE RELAY 75 DA-H FOTEK ORIGINAL.
- 8. 3 kg LPG and LPG regulators.

Eco-print Batik Steamer Machine

Daun Efek SMEs use conventional methods in carrying out the production process. This method causes Daun Efek SMEs to only be able to produce 6 pieces of batik cloth per day due to limited production tools. Overcoming these obstacles, the "STEAMER BATIK ECOPRINT" machine is designed to increase the production capacity of Daun Efek SMEs with various advantages as follows:

1. Special pot size batik fabric roll

The pot is specially designed to adjust the size of the batik roll, so there is no need to bend the fabric roll which causes crease marks on the batik fabric.

2. Temperature and water level regulation control system

This control system has temperature and water level sensors, so this machine will later regulate the gas output and adjust the size of the fire to suit the needs during the soaking process.

3. There is a batik fabric roll rack

This machine is equipped with a container rack that functions to carry batik cloth rolls so that it is easier to insert or remove finished batik cloth rolls.

4. The Frame Has Wheels That Are Easy to Move

The addition of wheels functions so that the machine can be moved easily, so that when you want to operate this tool it will be easier. The frame also makes all components more neatly arranged. This machine is also designed using galvanized hollow as its frame and has a roll iron for the roll process.

5. Low Pressure Stove 2 Burners

The use of a 2-burner stove aims to heat up faster and more evenly when compared to using only 1 burner.



Figure 4. Eco-print batik steamer machine design

The specifications of the Eco-print Batik Steamer Machine are as follows:

No	Specifications	Information
1	Frame Dimensions	1380 x 420 x 650 mm
2	Pot Dimensions	1350 x 340 x 400 mm
3	Energy Source	LPG
4	Production Capacity	18 pieces of batik fabric/day

Table 1. Specifications of eco-print batik steamer machine

Product Packaging and Marketing

The packaging of Daun Efek UKM products was changed from initially only using simple packaging and less attractive to consumers, now switching to packaging in the form of a green box with the Daun Efek UKM logo which has a good, creative element and imprints in the eyes of consumers.

In terms of marketing, the proposer took steps to market through social media such as Instagram, Shopee, and Tokopedia which in the account already uploaded Daun Efek SME products.

Outcomes Achieved

The community service program at Daun Efek UKM has 3 outputs, namely in terms of production management, product packaging, and product marketing. In terms of production management, it is proven that there is an Eco-print Batik Steamer Machine used by Daun Efek SMEs and is able to produce batik fabric from the initial 6 pieces of batik fabric per day to 18 pieces of batik fabric per day.

In terms of product packaging, there is a renewal of packaging from what was initially only simple and less attractive to consumers, now a new packaging has been created in the form of a green box with the Daun Effect UKM logo. The last output achieved is in terms of marketing, which currently SMEs have social media accounts Instagram, Shopee and Tokopedia that contain uploads of Daun Effect SME products, so that the marketing is more widespread than before.



Figure 5. Granting eco-print batik steamer machine grants to partner SMEs



Figure 6. Eco-print batik steamer machine



Figure 7. Partner product packaging

Evaluation

The evaluation of the implementation of the ECOPRINT BATIK STEAMER machine at the Daun Efek UKM showed positive results, although there are several things that need to be considered for the sustainability of the program. Technically, the use of this machine has succeeded in increasing the production capacity from 6 to 18 pieces of batik cloth per day. However, minor obstacles were found such as the need for additional training related to the operation of the machine, especially in temperature and water level regulation. Therefore, the proposer team recommends regular maintenance and technical assistance to ensure optimal engine performance. From the aspect of production management, this machine allows partners to reduce production time so that they can focus on product design development and innovation. However, further training is needed to manage a more efficient workflow as production capacity increases. In terms of marketing, the implementation of digital strategies through platforms such as Instagram, Shopee, and Tokopedia has succeeded in expanding market reach, supported by new packaging that attracts consumer attention. However, partners are expected to ramp up digital promotional activities with more aggressive strategies, including collaborations with local influencers, while ensuring packaging cost efficiency. Overall, the program has had a significant impact on partners, but the sustainability of its benefits requires ongoing collaboration between the proposer team and Daun Efek SMEs in technical, production, and marketing aspects.

CONCLUSIONS

The implementation of the "STEAMER BATIK ECOPRINT" machine to optimize the color transfer process in fabrics is able to increase the production of batik fabric in Daun Effect SMEs from the initial 6 pieces of batik fabric per day to 18 pieces of batik fabric per day, improving the quality of product packaging in the form of green boxes with SME logos, so that it has a good, creative, and imprinted element in the eyes of consumers and the expansion of Daun Effect SMEs consumers due to marketing on Instagram social media, Shopee and Tokopedia. The existence of hard skills training on tools and soft skills regarding product packaging and marketing improves thinking skills and production capabilities. This community service activity needs periodic machine maintenance to ensure that the machine can operate optimally. Both of partners and requirements are expected to continue to develop ideas related to the products produced, the quality of product packaging and the development of consumer reach on social media.

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