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Housewives' Role in Protecting the Environment through Recycling Cement Bags with Ecoprint

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A B S T R A C T

Maintaining the sustainability of the environment is a shared responsibility. This effort can be made by recycling existing waste. One of the wastes that has the potential to be reprocessed is cement bag waste. These cement bags have the characteristics of thick paper, no pattern, and neutral base color. Based on these characteristics, the ecoprint technique is a suitable choice. Ecoprint is considered suitable because it uses natural materials that do not damage the environment, and the motif patterns are obtained from leaves and flowers that fall in the environment around the house. This processing technique uses raw materials from the surrounding environment and can maximize organic waste in the surrounding environment. The results of this process can be used as home decoration, bags, and hats with a high and exclusive selling value. The selling price of ecoprint products for bags is around $15-$25. Wall displays are around $10-$20, depending on the type of item and how it is done.

1. INTRODUCTION

1.1. Research Background

One of the SDGS goals is the equality and empowerment of women. Women, especially mothers, are the pillars and have an essential role in the sustainability of the family. Being an empowered housewife is one of the goals to be achieved in community development. One of the efforts that can be made is to train housewives to be empowered in the economy based on the potential of the surrounding environment [1]. Mothers in the household have a central role in managing family finances. The more intelligent and wiser a mother manages finances, the happier and more prosperous she will be [2].

One way mothers can be independent in managing family finances is not to depend on their husbands for income [3]. Additional income can be made by utilizing what is in the surrounding environment, including recycling existing waste. In addition to reducing waste in the community, implementing recycling can also be a source of revenue. One of the wastes that can be recycled is paper. Cement paper has characteristics that are easy to recycle [3]. Cement bag paper has many layers and is relatively thick and waterproof, so it is suitable for recycling.

A suitable recycling method with an artistic and aesthetic value that is still rarely done on cement bags is to combine cement bags with ecoprint techniques. Ecoprint itself became popular and was first introduced in India in 2000. Ecoprint is a technique of printing fabrics using natural dyes and making motifs from leaves and flowers in the surrounding environment. This ecoprint technique was chosen because it can reduce waste and the materials obtained from the surrounding environment.

The training on ecoprint techniques can increase creativity and innovation in housewives. In the village area of Surabaya city, many plants and family gathering places can be used to make ecoprint. Various types of plants, including trees, flowers, and grass, can be used as motif materials in making ecoprint products.

In the villages, there are still housewives who have the enthusiasm to improve the family economy. Villages in Surabaya are located close to housing, campuses, and other business places that often carry out development activities. The primary raw material in making this ecoprint is relatively easier to obtain and does not cost too much. The supporting materials used to make ecoprint products are also environmentally friendly materials [4]. Recycling cement bags using the ecoprint technique is the right

choice to increase the economic potential of families based on environmental potential .

The mentoring process for partners is not only in the implementation of training but also up to the stage of partners in producing new products, communication with potential product buyers, product packaging and analysis of consumer responses to products produced by partners. This mentoring activity is carried out continuously to provide optimal benefits for partners.

1.2. Literature Review

Ecoprint is a technique of coloring and printing motifs with fabric, paper, leather, and other materials containing natural materials by utilizing sap in leaves and flower shapes by adding natural colors [5]. According to Ref. [6] ecoprint is a natural dyeing process carried out so that cellulose fibers can be directly penetrated with color. Ecoprint is also the process of transferring colors and shapes of leaves and flowers to fabric through direct contact between fabric and leaves [7]. materials that can be used for ecoprint are:

a. Fabric
b. Paper
c. Leather

The dyes are obtained from leaves, flowers, fruits, seeds, stems, roots, and sap from plants. The types of leaves and wood used are *nila* leaves, *tegeran* wood, guava leaves, tea leaves, and *mengkudu* roots. The types of flowers that can be used to form patterns are *tabebuya*, *frangipani*, *kenikir*, and *waru* flowers.
In the process itself, there are three techniques, namely:

a) Pounding technique (hit)

It is a technique in ecoprint to get motifs done by hitting. In this technique, leaves and flowers are placed on the media, either cloth or paper, then hit using a cloth. The way to do this technique is to put a cloth coated with paper or plastic, then place the leaves and flowers on the cloth, then cover the rest of the cloth. After that, hit the cloth that has flowers and leaves so that it releases color; after that, leave it for 15 minutes and let it stand for 2-3 days so that the color is more absorbed.

b) Steaming technique (steamed)

It is a technique in ecoprint to get motifs done by steaming. This technique steamed the fabric attached to the leaves and flowers. This technique can be used by spreading the fabric and then placing the leaves and flowers. After that, the fabric is folded in half. The next step is to place a small pipe at the bottom of the cloth and roll it up. After that, it is steamed for 2 hours.

c) Leaf fermentation technique

This technique is done by soaking flowers, leaves, and other plant parts with vinegar to bring out the color. Then place them on the surface of a cloth that is spread out, then covered and hit with a hammer.

1.3. Research Objective

Based on the explanation above, this activity is carried out to minimize waste in the community so that environmental sustainability is maintained, increase the economic empowerment of housewives through increasing income with ecoprint and create superior village products as one of the village's superior products.

2. MATERIALS AND METHODS

2.1. Important Stages of Ecoprint

The training was conducted in this activity using ecoprint techniques in fast-mordant fabric media. In this method, there are two initial stages carried out, namely:

a. Scouring is the stage of washing the fabric from dirt. This stage is essential because it improves the color absorption process and binds natural colors to distribute the fabric color evenly. The steps taken are:
   - Putting one spoon of soda ash with 4 liters of water and stirring until evenly distributed.
   - Putting the fabric into the soda ash solution and boil for 30 minutes. Then remove and rinse with clean water.
b. Mordant is a process to prepare fabric fibers to receive natural colors and plant traces. The materials needed in mordant are 1500ml of water at room temperature, one bottle cap of vinegar, 50 grams of sodium bicarbonate (baking soda), 150 grams of alum, 15 grams of *tunjung*. The mordant steps are as follows:
   - Dissolve the vinegar in 1500 ml of water and stir until evenly distributed.
   - Add sodium bicarbonate to the vinegar solution and stir until the foam disappears.
   - Dissolve alum with warm water; gently add it to the previous solution after it cools. Enter it slowly because there will be a foam reaction; stir the foam in the solution until it disappears.
   - Add the iron and stir until evenly mixed.
   - Soak the cloth while kneading in the mordant solution for five minutes, then dry it in the sun until it dries.
   - After drying, soak in calcium carbonate (limestone), which has been dissolved in 3 liters of water for 5 minutes, knead, remove, and rinse with clean water. The fabric is ready to use.
c. After the above process, the ecoprint process can be done as follows:
   - Place a plastic mat before stretching.
   - Place the leaves and flowers on the main fabric that has been scoured and mordanted.
   - On the cover cloth after scouring and drying, put in natural dyes and soak for 24 hours. After that, squeeze.
   - Cover the main fabric arranged with leaves and flowers with a cover cloth, then cover the fabric with plastic and step on it with your feet so that the color and texture of the leaves and flowers are more apparent.
   - Roll the fabric that has been stepped on using a pipe, then steam it for about 3 hours.

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Figure 1. Ecoprint Materials

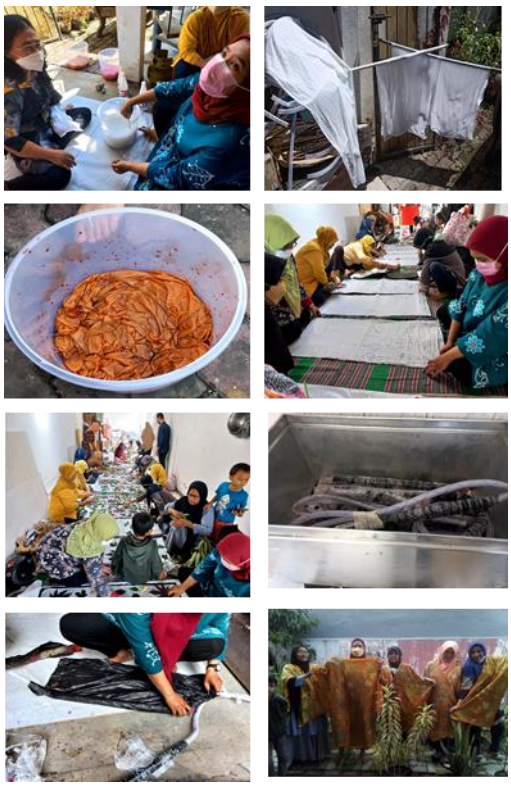

Figure 2. Stages of Ecoprint work

3. RESULT AND DISCUSSION

3.1. Development Results by Mothers

Training using ecoprint is a need from partners of STIESIA Surabaya community service activity who want a touch of innovation in previous products. After this activity, the women began to practice the knowledge gained to become several handicrafts with selling value, including veils and bags and ecoprint shoes. The mothers developed their products according to their craft interests. The following is the form of handicrafts made by mothers whose basic knowledge is obtained from the training results [8].

Figure 3
a veil made by
Mrs. Dani

Figure 4
Shoes made by
Mrs. Indra

Figure 5
a bag made by
Mrs. Selvi

Many innovative development works made by mothers participating in the activity, it is hoped that this activity can increase creativity and a source of income for mothers and the environment around mothers [2, 4, 8]. Veil products are sold at prices between IDR 100,000 and IDR 150,000. Shoes products are sold at prices between IDR 200,000 and IDR 500,000. Bag products are sold at IDR 250,000

3.2 Innovations that are accepted by the international market

In addition to the products above, one of the mothers who tried to innovate with ecoprint was Mrs. Ermin by developing ecoprint using the media of used cement bags. The selection of used cement bags is due to the primary color of cement, which already has a natural color, tight and waterproof paper fibers, and thick paper. The process of making ecoprints using paper-based materials is as follows:

- - The paper is soaked with water that has been given dish soap for a while to remove dirt on the paper.
- - After drying, the paper is sprayed with water to moisten it, and the leaves and flowers can be attached.
- - Then, the paper is rolled tightly with the help of a hose. Then wrap around the rope until it is complete, so the leaves and flowers are not easily separated.
- - Heat the steamer; the wrapped paper is steamed for 1 to 1.5 hours.

The products produced by Mrs. Ermin are very diverse. Mrs. Ermin's work is also in great demand by foreign tourists who come to the festival and cruise ship tourists who come to Surabaya. The products produced are also diverse and mainly craft products. Ms. Ermin's products also allowed her to showcase her products on the Indonesian Terrace at IKEA Surabaya. Here are photos of Ms. Ermin's activities.

Figure 6
Photo of Ms. Ermin and her products at IKEA's Indonesian Terrace

The products sold by Mrs. Ermin range from tote bags, tissue holders, umbrellas, wall displays, home displays, hand fans, hats, wallets, and other home decorations. The bag's price is IDR 350,000, and the price of the wallet is IDR 150,000. Bu Ermin's average paper ecoprint products are sold between IDR 150,000 to IDR 2,000,000 depending on the type of craft and the difficulty level.

So far, Ms. Ermin's customers are consumers from Europe and America. In recent years, Bu Ermin's handicrafts have also attracted customers from Asia, especially from Thailand. One of Ms. Ermin's products, a paper umbrella, was purchased by a Thai customer who used it as dance equipment. Here is a photo of the products that are in demand in Thailand.

Figure 7
Photo of paper umbrella products at the festival with buyers from Thailand

Following up on the interest of consumers in Asia in Mrs. Ermin's products, the STIESIA Surabaya service team tried to connect Mrs. Ermin with potential buyers and academics in Thailand to offer ecoprint paper products in Thailand and get reviews from academics and potential buyers. This activity was carried out through Zoom.

The product used as a market opener is an ecoprint bag made from cement bag paper. According to the team of lecturers, this bag was selected because it is unique and has a high sustainable value for the environment. In addition, the motifs on each bag will always be different even though the bag's shape is the same because it depends on the types of leaves and flowers used. Here is a photo of the activity.

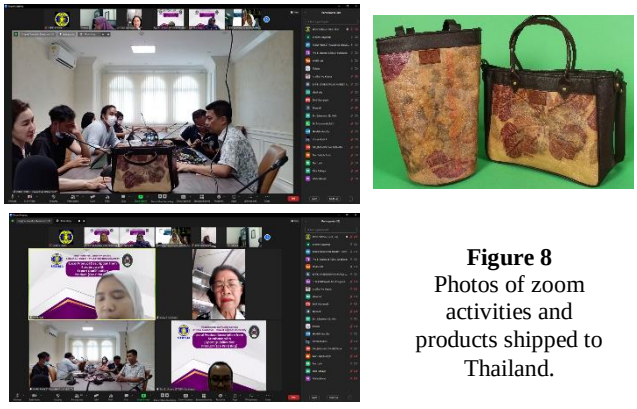

Figure 8
Photos of zoom activities and products shipped to Thailand.

4. CONCLUSION

Ecoprint is one of the emerging color and shape techniques in Indonesia. This technique is relatively easy to apply to all media. The materials used are environmentally friendly and cheap, so they are suitable for maintaining environmental sustainability. Optimizing the role of mothers in producing handicrafts that have economic value but do not damage the environment is an activity that is in line with the government's promotion of SDGS program.

Providing ecoprint training is essential for partner product innovation. What is more important is to assist partners in processing and getting optimal results. Partners' success certainly also impacts the surrounding environment where partners are located, including creating new jobs, a cleaner environment, and the growth of an economic, creative eager. The more empowered a mother is, the more empowered the family will be. The more empowered families in Indonesia, the more prosperous Indonesia will be.

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