ABDIMAS: Jurnal Pengabdian Masyarakat Universitas Merdeka Malang
Vol.9(4) November 2024, 1031-1042
p-ISSN: 2721-138X e-ISSN: 2548-7159
http://jurnal.unmer.ac.id/index.php/jpkm

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Strengthening women's capacity through ecoprint batik making training in realizing the sustainable development goals

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ARTICLE INFO:

Received: 2024-09-18
Revised: 2024-10-21
Accepted: 2024-11-08
Published: 2024-11-30

Keywords:

Ecoprint, Sustainable development goals, Women's capacity

ABSTRACT

Ecoprint making is one of the opportunities that can be done by the community, especially women, particularly in this digital era to increase income. The training on ecoprint-making in Mojorejo Village targets women from various professions, including housewives, sewing groups, PKK mothers, and others. This is one of the leading work programs chosen by the community service team. The community service team chose this work program with the aim of empowering women through training and mentoring programs for making ecoprint batik. Additionally, the ecoprint-making training tends to be more straightforward and easier to follow. This work program is a leading program due to its simple method, easy-to-find materials, and ability to produce high-value products. We carry out this training in stages, incorporating lecture methods, question and answer sessions, practical exercises, and modules. This training activity resulted in the creation of ecoprint products made directly by participants, such as tote bags, cloth, and headscarves. This activity results in the cessation of the Standard Operating Procedure for running the Ecoprint program under the village's auspices.

How to cite: Wulandari, S., Salsabila, H., & Damainingrum, V. D. (2024). Strengthening women's capacity through ecoprint batik making training in realizing the sustainable development goals. Abdimas: *Jurnal Pengabdian Masyarakat Universitas Merdeka Malang*, 9(4), 1031-1042. https://doi.org/10.26905/abdimas.v9i4.14010

1. INTRODUCTION

SDG 5 reflects the importance of strengthening women's capacity to achieve the Sustainable Development Goals (SDGs), particularly in the context of gender equality and empowerment. Women's empowerment is not only a matter of social justice; it is also essential for sustainable development. Research shows that persistent gender gaps hamper efforts for sustainable growth and development globally (Jayashree et al., 2023). Empowering women increases their participation in various sectors, including agriculture, health, and leadership, which in turn contributes to broader economic and social benefits (Matthew et al., 2022).

The data above is the level of presentation of the gender equality index from various sub-sectors that have been released by (World Economic Forum, 2023). The data indicates a more positive shift than in past years. The data shows that the economic participation rate has reached 60 percent. This indicates an equal representation of each gender (Árbol-Pérez & Entrena-Durán, 2021; Wulandari et al.,

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2024). The level of economic participation is a measure that the availability of services in terms of gender equality has ensured equal access for men and women. Increasing women's economic participation and achieving gender equality in leadership, both in business and government, are two of the main drivers for addressing the wider gender gap in households, communities, and the economy (World Economic Forum, 2023).

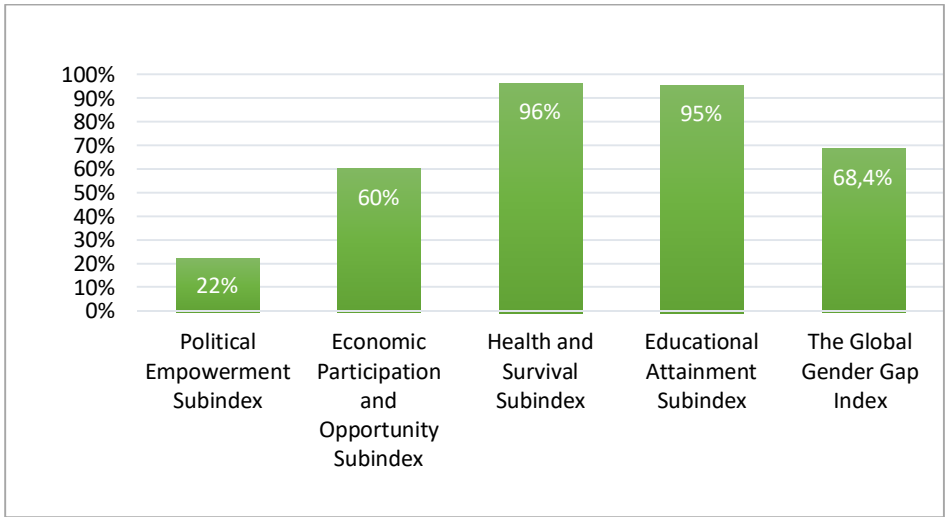

Figure 1. Gender equality index of various sub-fields at the global level
(Source: World Economic Forum, 2023)

Women play an important role in various sectors, including agriculture, education, and health. In many countries, they are involved in sustainable development projects that focus on improving access to basic services, skills training, and financial support (Guthrie et al., 1999). For example, in Pakistan, women are involved in development projects that include advocacy for gender equality and equitable health care provision (Sharma et al., 2023). Furthermore, research in Indonesia shows that strengthening women's roles at the village level can help achieve the SDG indicators, especially in the context of sustainable development (Charani et al., 2023).

However, big challenges remain. Many women, especially in rural areas, face structural barriers that prevent them from participating fully in the development process (Ariyani et al., 2023; Carmona, 2019). This includes a lack of access to resources, inadequate education, and social norms that limit their role (Ariyani et al., 2023; Khanal, 2023). Therefore, it is important to develop policies and programs that not only recognize but also support the role of women in sustainable development (Kerras et al., 2020; Ogato, 2013).

Women can be the main actors in making changes in a region (Lukman, 2024). Through empowerment and education, women can change themselves and their generation by teaching many things that are in accordance with the development of the times (Maryanah et al., 2024). Therefore, Mojorejo Village conducts community service with a focus on women's empowerment. Mojorejo Village is one of the villages located in Ngraho District, Bojonegoro Regency. Indonesia's abundant natural potential gives it the strength and opportunity to pursue an environmentally friendly livelihood (Aryani et al., 2022). The potential in Mojorejo Village lies in its agricultural land, where a variety of plants thrive. Teak plants, cassava, papaya, eucalyptus oil, and wild plants are among the various types of plants that thrive in the village. The abundance of natural resources enables the production of valuable products,

including ecoprints. Most people are still unfamiliar with ecoprintsEcoprint refers to a manual printing method that employs natural materials such as leaves, twigs, roots, or flowers, adhering them to the fabric through a specific method until a distinct pattern emerges (Tazkiyah et al., 2024).

Ecoprint differs from batik in that it relies heavily on the technique of arranging leaves and flowers on the fabric to create a beautiful pattern (Faridatun, 2022). Ecoprint is a technique for adding patterns and colors to materials or fabrics using natural materials such as leaves, flowers, wood, roots, and others. The advantage of ecoprint is that it is an environmentally friendly product because it does not use chemicals, the manufacturing process tends to be easy to do, and the materials needed are also easy to obtain because they come from plants, both leaves, flowers, and roots.

The batik ecoprint training conducted in Mojorejo Village aims to support the achievement of the Sustainable Development Goals (SDGs), especially SDG 5 which focuses on gender equality and women's empowerment. In this context, strengthening women's capacity through ecoprint training is an important strategy to encourage their active role in sustainable development (Khanal, 2023; World Economic Forum, 2023). Mojorejo, with its wealth of natural resources such as teak trees, cassava, and various local plants, has great potential to produce ecoprint products with economic value (Aryani et al., 2022). However, women in this village still face obstacles such as limited access to skills training and economic resources. Through this training, it is hoped that they can process local potential into high-value products, while increasing the role of women in the family economy (Matthew et al., 2022). This training approach not only supports poverty alleviation (SDG 1), but also contributes to environmental conservation through the use of environmentally friendly natural materials (Muminah et al., 2023). As such, the training offers holistic solutions to social, economic, and environmental challenges, while positioning women as agents of change in their societies (Juhairiah et al., 2024).

Mojorejo Village empowers women by training them to create ecoprints, harnessing the potential of local natural resources. With the increase in skills, Mojorejo Village residents, especially women, can increase the added value of products with the characteristics of utilizing the natural potential in the village so that zero proverty is realized. Zero proverty means ending all forms of poverty so as to ensure the fulfillment of the rights of all people with a decent standard of living. Working for an agency or company does not necessarily alleviate poverty. Talking about poverty is not something that has just emerged or been heard. The development of increasingly sophisticated technology still makes poverty dominant because, in its development, it ignores social and cultural. The impact caused by this is uneven development that has an impact on the welfare of the community (Armoyu, 2013). The government currently offers a wide range of assistance, including health, education, seed assistance, and more. This shows that the government positions the community as a subject in development, which then needs community empowerment in order to create prosperity for the community itself.

Creative ideas, developed by utilizing existing natural resources to produce valuable products, can initiate poverty alleviation. Ecoprint presents a promising business opportunity, particularly in the fashion sector, as the advent of the digital era has made it easier for everyone to access information. A business opportunity is one that is creative, innovative, and environmentally friendly. Given the current widespread use of natural dyes, it is likely that these dyes will remain sustainable due to their inclusion in renewable natural resources, provided that the primary raw material, namely plants, continues to be updated (Asmara, 2020). This is a value in itself and a uniqueness in itself that makes ecoprint a product that is worthy of selling and most importantly, environmentally friendly (Hikmah & Retnasari, 2021). So that ecoprints can be used as a new lifestyle or an environmentally friendly community trend (Juhairiah et al., 2024). In order to preserve nature by reducing the use of chemicals, the community is expected to produce environmentally friendly products by utilizing nature as the main ingredient (Yuliani & Puspitasari, 2024).

By integrating skills training with broader community development initiatives, we can create an environment that supports women's empowerment and the achievement of SDGs. Overall, strengthening women's capacity through ecoprint batik making training is a strategic step in achieving sustainable development goals. By providing women with the necessary skills and supporting them in actively participating in the economy, we can help address gender inequality and improve the well-being of society as a whole.

Thus, the training offers holistic solutions to social, economic, and environmental challenges, while positioning women as agents of change in their societies. The main objective of this program is to empower women in Mojorejo Village through ecoprint skills training, so that they are able to produce products of high economic value by utilizing local natural resources. With these skills, the program aims to increase family incomes, support poverty alleviation (SDG 1), and strengthen the role of women in sustainable development (SDG 5). In addition, this training is also designed to support environmental sustainability through the use of environmentally friendly ecoprint techniques.

2. METHODS

Implementing ecoprint-making training can enhance residents' understanding, thereby contributing to the development of human resources, particularly women, in Mojorejo Village. Ultimately, it will yield fabrics that the fashion industry can utilize, enhancing the local culture and contributing to its economic and environmental value. In the implementation of ecoprint-making training, it is divided into 2 stages. The initial phase involves elucidating the training activities, followed by their practical application. The activity we implemented involved driving a car. We conducted two meetings to implement the activity, teaching two distinct techniques at each meeting. We taught pounding techniques in the first meeting, and steaming techniques in the second. The second stage involves evaluating the success of the training implementation, identifying obstacles encountered during the training, and devising solutions to address any issues that may arise. In addition, sustainability was also discussed after the ecoprint-making training activities, which can have an impact on human resources, especially women's empowerment.

Implementation Stages

Presentation

At this stage, the goal is to familiarize participants with ecoprint and provide an overview of its development to date. Furthermore, the resource person shared his personal experiences in the fashion industry, particularly in the realm of ecoprints, with the aim of inspiring the participants to sustain their ecoprint production in Mojorejo Village. Additionally, during this phase, the resource person provided examples of the outcomes of ecoprint products to the participants.

Practice

The practice tools and materials are explained before practice. The goal is for participants to comprehend the appropriate tools and materials for each technique. The materials and tools utilized align with the techniques being executed. Participants in this activity also received modules to ensure they wouldn't encounter any difficulties during the manufacturing practice.

Review

In the implementation of the review, the resource persons were involved in providing comments and evaluations about the product results that the participants had made. The evaluation provided

participants with feedback on their achievements, enabling them to identify areas for improvement, thereby enhancing the quality and value of their products.

Closing

The final phase, known as the closing, occurs on the second day and represents the final technique in this training. In this case, the resource persons and the organizing team said goodbye to the participants at the Mojorejo Village Hall.

Activity Materials

The organizing team and the resource persons have discussed the materials used in this community service. The ecoprint-making training selected two techniques for research: pounding and steaming. The organizing team selected these two techniques due to their ease of use and suitability for beginners in the ecoprint field. The team has also tailored the provided material to align with the training's objectives and meeting schedule. In its implementation, community service activities, especially ecoprint-making training, were divided into 2 meetings.

Tabel 1. Stages of ecoprint training community service activities

Meeting 1	
Activity	- Explanation of the implementation method - Introduction of the organizing team - Introduction of equipment and materials to be used - Introduction of ecoprint products that have been made by resource persons - Practice of making ecoprint products using pounding technique with totebag media
Purpose	- Introducing the method of implementing the service program and introducing the group (organizing team). - Explain the purpose of the ecoprint making training - Introducing the tools and materials used in the manufacture of ecoprint products with the pounding technique with totebag media - Providing new insights and knowledge to mothers so that they can make their own products with economic value
Meeting 2	
Activity	- Presentation of material by resource persons regarding steaming techniques - Introduction of tools and materials used in the manufacture of ecoprints with steaming techniques - Practice of making ecoprint products with steaming techniques
Purpose	- To provide new insights and knowledge to participants regarding the manufacture of ecoprints using a new technique, namely the steaming technique - To introduce to the participants what tools and materials are needed in making ecoprint products using the steaming technique

3. RESULTS AND DISCUSSION

The ecoprints activity was conducted using four methods. First, the speakers introduced and explained the concept of ecoprints using the lecture method, which aimed to familiarize participants with the procedures, materials, tools, and various techniques involved in the process. To enhance understanding and engagement, a question-and-answer method was also employed, facilitating

smooth interactions between the resource persons and participants while ensuring effective delivery of the material. Additionally, the speakers directly demonstrated the techniques they had previously explained, allowing participants to observe and apply the methods in practice.

Participants were encouraged to utilize the training modules as comprehensive guides to execute ecoprints practices. These modules provided step-by-step instructions and served as valuable resources for sustaining the knowledge and skills acquired during the training. The two-day training began with an introduction by the organizing team, who explained the training objectives, rules, and provided the necessary equipment. Each day focused on a different ecoprints technique, ensuring participants gained both foundational knowledge and practical skills to support their independent application of ecoprints methods.

Socialization and Practice of Making Ecoprint Batik with Pounding Techniques and Steaming Techniques

On the first day of the event, the resource person presented information about creating ecoprints using the pounding technique. Following the material presentation, the speakers showcased a variety of their creations, including tote bags, fabrics, clothes, hijabs, and other items. Subsequently, the resource persons directed the participants and provided them with modules to guide their practice. The design of the ecoprint making activity incorporated the pounding technique.

The visit to the Mojorejo Village Hall was conducted by presenting resource persons, PKK chairmen, and participants who included tailors, housewives, and representatives of PKK women. The village hall hosted training activities. The resource person presented information about ecoprints, materials, tools, and pounding techniques. The resource person used a lecture and question-and-answer method to present the material, fostering interaction between the participants and the resource persons. We then introduced the necessary tools and materials for executing the pounding technique. A tote bag serves as the medium for this pounding technique training. The material that can open the fabric fibers is recognized as soaking the fabric in an alum solution, which allows the fabric to absorb the dye to its maximum potential. Previously, the resource person personally conducted the alum soaking process to reduce the duration, as soaking the cloth in the alum solution takes approximately 6 hours, a process commonly referred to as the mordanting technique. The mordanting process aims to enhance the natural dyes, thereby enhancing the clarity and sharpness of the produced colors. Following the mordanting process, one can either store the fabric or use it immediately for the next step.

Then, the practice of making ecoprints using pounding techniques was continued. We source the main material, leaves, from the Mojorejo Village environment. This technique also introduces leaves with strong color elements, enabling their use in the pounding process. After introducing the leaf material, it is prepared in the form of a totebag that has undergone the mordanting process, and then the totebag is turned over so that the inside is visible. Then insert the transparent plastic flat on the inside of the totebag and place the leaves with the back of the leaf facing up. The back of the leaf plays a crucial role in releasing the color element. Next, place the transparent plastic on the tote bag's exterior before commencing the beating process, and continue until the leaf pattern takes on its perfect shape. Next, we proceed with the fixation process, which involves dissolving the tunjung in water and stirring until it becomes smooth. After it is smooth, insert the totebag that has gone through the pounding technique and soak for 15 minutes. After soaking for 15 minutes, rinse the totebag with clean water and let it air until dry. Ecoprint totebags with pounding technique are ready for use. Figure 2 shows the process of resource persons who are presenting material to participants and introduction by the organizing team.

Figure 2. Presentation of material by resource persons

The organizing team presented the materials and provided an introduction, after which they introduced the tools and materials needed to create ecoprints using the pounding technique. The pounding technique involves printing leaf or flower motifs on plastic-coated fabric by striking them with a hammer (Octariza & Mutmainah, 2021). Subsequently, the participants conducted the practice under the direct guidance of the resource persons. The resource persons provided a whip as the beating tool in practice, citing its affordability and ease of use. In the manufacture of ecoprints, not all textile materials can be dyed with natural dyes; textile materials must come from natural fibers such as wool, silk, and cotton (Fitrihana, 2018). As a result, the medium used in this training is a tote bag made of natural fibers. Figure 2 will show the participants' practices in making ecoprint products with totebag media using the pounding technique.

Figure 3. Practice of making ecoprint products with pounding technique

Following the pounding technique, soak the totebag in the alum solution for 15 minutes. Soaking the fabric with alum can produce a darker color than soaking using vinegar (Masyitoh & Ernawati, 2019). This technique is called the fixation technique, this is done so that the color of the printed leaves does not fade and the motif becomes more visible. Figure 4 will provide instructions from the resource persons and the participants on how to perform the fixation technique correctly.

Following the fixation technique, rinse the totebag with clean water and let it air dry. Then the totebag is ready to use. The next figure will show how the training participants made ecoprints using the pounding technique with totebag media.

The training on creating ecoprints using steaming techniques resumed on the second day. Just like the first day, we began the practice by explaining the steaming technique and introducing the necessary tools and materials. Subsequently, we proceeded with the practice, arranging the leaves on a moistened

cloth, which we then placed on a large plastic sheet. Small groups of four people each participate in this holiday practice. The organizing team provides cloth to each group for the creation of ecoprint items. The design of the steaming technique for the ecoprint making activities is the responsibility of each group.

Figure 4. Fixation technique
Figure 5. The result of making ecoprints with pounding technique on totebags

The visit to the Mojorejo Village Hall was conducted by presenting resource persons, PKK chairmen, and participants who included tailors, housewives, and representatives of PKK women. The village hall hosted training activities. The resource person provides an introduction to the equipment, materials, and steaming techniques. When creating ecoprints using the steaming media technique, the fabric can take the shape of a hijab or mukena. The material that can open the fabric fibers is recognized as soaking the fabric in an alum solution, which allows the fabric to absorb the dye to its maximum potential. In the practice of soaking alum before, it has been carried out by the resource person himself to shorten the time because soaking the cloth in the alum solution is quite time-consuming, which is about 9 hours or a day and is commonly called the mordanting technique.

To process leaves, soak them in vinegar for 15 minutes. However, to achieve a dark color and reveal the leaf skeleton, some leaves require soaking in tunjung water for 1 to 3 hours, depending on their thickness. Prepare the fabric, line it with plastic, then stretch and flatten it until it is no longer bulging. Then lay the leaves on the cloth that has been abstractly painted according to creativity. Then roll the plastic together with the cloth, then tie it tightly using a rope. Next, we steam the material for an hour. After an hour, lift the cloth, open it, and wind it dry. Perform the fixation for 15 minutes, then rinse with clean water until it does not fade. Then it is dried by air, and the fabric is ready for use.

Figure 6. Making ecoprint batik with steaming techniques

Figure 6 shows participants arranging leaves on cloth according to their wishes and creativity. After arranging the leaves, participants roll the cloth with plastic and tie it tightly with raffia rope. Next, steam the cloth for approximately 1 hour. After an hour, you can remove the cloth from the steamer and allow it to dry.

Figure 7. Results of ecoprint batik-making participants using the steaming technique

Figure 7 displays the fabric pieces created by the participants. After steaming, the participants first air dry the fabric in the sun, followed by color locking, also known as the fixation technique, which takes approximately 15 minutes. Like the pounding technique, we rinse the fabric clean after fixation and repeat the drying process until it dries. Only then is the fabric ready for use, or we proceed to the next process, such as making clothes, vests, and other items.

Evaluation of Ecoprint Batik Training Outputs and Outcomes

The training program for ecoprint techniques in Mojorejo Village aims to foster creativity and offer novel experiences, particularly for the women in the village. The training also aims to inspire housewives to utilize local natural resources to produce economically valuable products. Mojorejo Village primarily consists of agricultural land, where numerous plants thrive, including cassava, papaya, teak, and eucalyptus trees. All parts of the plant can be used as the main ingredient to make ecoprint products. Therefore, the target participants in this training are women.

Based on this, the organizing team from KKN-TK 20 Bojonegoro University gave the following results: (1) The training activities that involve making ecoprints using two techniques, namely the pounding technique and the steaming technique, have provided women, particularly housewives and tailors, with new experiences and insights. They are more motivated to make products with economic value in order to help Mojorejo Village achieve zero poverty; (2) The participants have new insights into how to use the natural resources around them. Particularly, they employ leaves, flowers, twigs, and roots as the primary components for creating ecoprint products.

The team also analyzed the output flow and outcomes of this service. The community service team analyzed the flow from the start of this activity to the output it produced (Figure 8).

The community service program in Mojorejo Village is supported by several factors, including the village's assistance in providing facilities for the training, and the participation of housewives, tailors, and representatives from PKK mothers, all of whom directly contributed to the success of the ecoprint training program. During the training activities, the participants' enthusiasm was evident. This is evident from the number of participants who attended the implementing team's training. The target sThe implementing team set a target of 25 participants for the training, and 97 percent of these individuals attended the

training. The attendance of participants did not decrease the following day; in fact, the number of participants who attended exceeded the target of 25. hat the training carried out by the organizing team attracted their interest in adding new insights and experiences. Third, in the implementation of the activity, there were no obstacles either internally or externally. This happened because previously the organizers had asked for permission from the village head, village apparatus, and PKK chairperson to be able to carry out this activity at the Mojorejo Village Hall, and the activity was carried out at 9 am so that the mothers had carried out their obligations as housewives to prepare food and take their children to school. Finally, the activeness of the organizing team in preparing the place, tools, and materials needed in the activity to prepare food for the participants so that the participants were comfortable and did not feel bored and tired during the training.

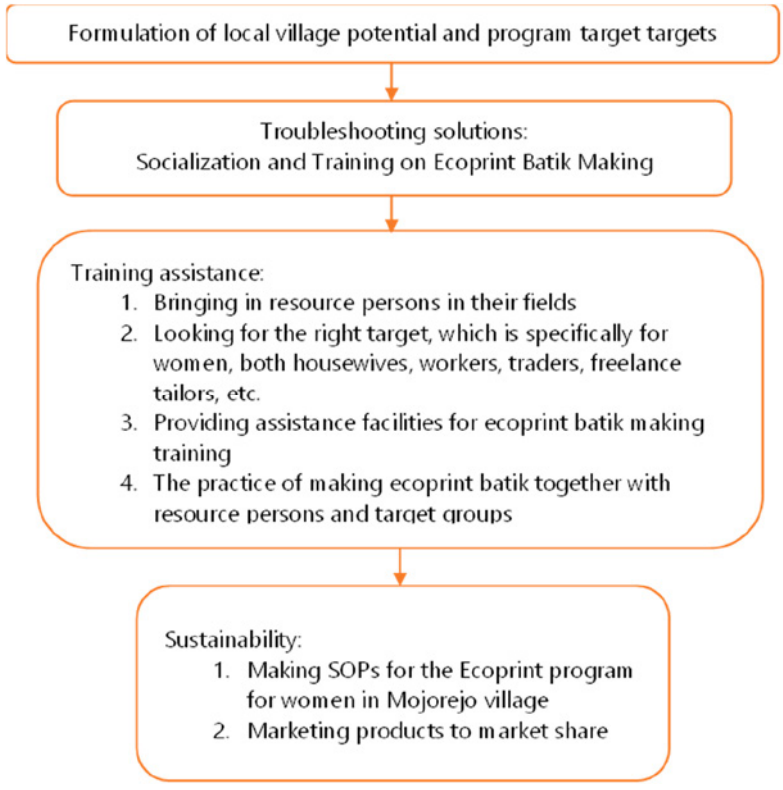

Figure 8. Chart of the process and output of community service activities for the ecoprint batik making training program

4. CONCLUSION AND RECOMMENDATIONS

This community service program aims to provide new insights to participants, especially women with the role of housewives and workers, both from tailors and others in Mojorejo Village regarding the manufacture of ecoprint products that utilize natural resources in the surrounding area. This training program was successfully implemented because of the facilities, equipment, and enthusiasm of the community, which directly became supporting factors for the success of this training activity. The results achieved were that the targets that had been selected by the organizing team had new insights so that they had the opportunity to produce their own, which would have an impact on their own economy. After that, indirectly, new job opportunities will open up for all groups. It is hoped that this training

activity can continue and be developed because the results of ecoprint products are currently very valuable, which will later have an impact on increasing the economy of residents.

It is better if this ecoprint training program can be developed again so that the benefits of this training continue and have a good impact on the economy of the residents, and also the empowerment of women will continue to run along with the development of the times. If the economy of the residents increases, zero poverty will be realized in the village, and the success of increasing women's capacity will be realized. It needs to be monitored and accompanied again and again to ensure that the insight and skills regarding ecoprint making are more comprehensive. And it can encourage residents who have participated in the training program to share their insights and skills in implementing similar training programs.

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