



# Experiment of Potential Vegetable Waste as a Natural Dying Media Using Ecoprinting Technique

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**Abstract.** Lembang is a sub-district in West Bandung Regency, West Java, Indonesia. One of the main factors most of the population of Lembang make a living, gardening, farming and trading. Good natural potential makes Lembang a center for education and research for agriculture and animal husbandry, as well as Lembang has abundant vegetable commodities, one of the areas of Gunung Putri. The process of processing vegetable waste media obtained from several farmers in this mountain area, will be made as one of the knowledge that will be applied to PKK mothers around Gunung Putri, with the application of *ecoprinting craft science* using vegetable waste that is around the community Gunung Putri, as a form of developing potential new livelihoods for the women of the PKK community in Gunung Putri. by using the existing vegetable waste material as one of the environmental concerns for the waste that is around the Gunung Putri community.

**Keywords:** Waste · Vegetables · Ecoprinting

## 1 Preliminary

The process of processing vegetable waste media obtained from several farmers in this mountain area, will be made as one of the sciences that will be applied to PKK mothers around Gunung Putri, with the application of ecoprinting craft science using vegetable waste around the community. Gunung Putri, as a form of developing potential new livelihoods for community women, Ibu PKK in Gunung Putri. by using the existing vegetable waste material as one of the environmental concerns for the waste that is around the Gunung Putri community.

However, before the application itself, we must carry out some research in it, using laboratory research to get a result of the vegetables or the resistance of these vegetables when applied to fabrics using the ecoprinting technique, by using this laboratory research we can find comparative numbers of materials that can be used. Used with the best level of resistance if applied using the ecoprinting.

This laboratory research must pass several experiments to find a good substance for the application of the waste into ecoprinting techniques, with this laboratory research it is expected to get a good comparison to support a result from the craft of the ecoprinting waste making fabric crafts that can be sold at affordable prices. Use value.

The results of this study are expected to have theoretical or practical benefits. The benefits of this research are theoretically as a contribution to the world of education in improving the quality of research through research based on the development of vegetable waste as a valuable handicraft product. Use by using resistance and the level of research using practical laboratory tests and testing the level of resistance directly using the practice of batik eco-printing directly, from the results of this study can be used as an interpreter or reference for an idea from vegetable waste processing techniques that can be used. Made, a use value craft by using several studies that concretely use laboratory tests and direct batik practice.

## 2 Research and Methods

The development model used in this development is ADDIE models which is one of the systematic learning design models [1] suggests that at the material design level, learning and development, systematic as a procedural aspect of the systems approach has been embodied in many practice methodologies for the design and text development, audiovisual materials, and -based learning materials computer. Selection of this model based on the consideration that this model systematically developed and based on the theoretical foundation of design learning.

This model is structured in programmed with sequences of activities systematically in an effort to solve learning problems related to learning resources in accordance with the needs and characteristics of learners. Model It consists of five steps, namely: (1) analysis (analyze), (2) design (design), (3) development, (4) implementation (implementation), and (5) evaluation (evaluation).

In an effort to find a problem-solving strategy based on empirical facts, there is still a lot of waste in the community that can be used as an innovation that has use value, with the accumulation of waste in the community that results from the sorting of vegetables made by farmers, this can be done innovate as one of the additions of handicrafts that have a use value, Plants are nature's potential as textile coloring agents that do not produce compounds harmful to the environment and health [2], the following problem development strategies include: Research, evaluation and development. Through several preliminary studies which were developed starting with:

- The analysis of the potential and problems that exist is covered by the potential for waste in the vicinity of the Gunung Putri community who have problems with increasing vegetable sorting waste which will be developed through waste research as a craft innovation that will make batik using ecoprinting techniques as a use value product.
- The collection of data and information then proceeds to the second stage, namely the collection of data and information that supports the waste research, by collecting data on the substance and level of resistance of vegetable waste and information on the tengang data, the use of ecoprinting techniques that will be applied in the research.
- Designing a conceptual learning model, then the next stage is the preparation of a waste research model design using ecoprinting techniques using waste as one of the conceptual learnings, which will be developed to the community of mothers of PKK Gunung Putri Lembang, as one of the extensions of craft innovation science that can

be a development, for the livelihood of the people around Gunung Putri Lembang. Using several resistances, namely personal experiments by researchers and then in the form of an application model, which will be distributed to the community itself.

- Validation of the product, then the fourth stage with the validation of product resilience and innovation, the researchers examined the extent to which the waste development could have a use value that could be traded to the community, prior to outreach to the community in the Lembang Gunung Putri area.

After the value and results of the experiment using two reference stages of development practically get a result and a comparison of several, the level of resistance of a substance that has been tested in the experiment, then to the stage for product application using the techniques and materials that have been compared. Using the results of each experiment, with the results of the experimental development of products using this eco printing technique, making the results that can be continued into the stages of making the product which is called the Final product penetration.

### 3 Natural Dyes

Color is one of the main attractions, and an important criterion for acceptance of products such as textiles, cosmetics, food and others [3]. Dyes are needed to add artistic value and are used in varying a product [4]. The art of color application has been known to humans since ancient times, in 3500 BC (BC) humans have used natural dyes extracted from vegetables, fruits, flowers, and insects [5]. This is confirmed by the findings of colored clothing and traces of dye from madder in the ruins of the Mohenjodaro and Harappa civilizations 3500 BC. The mummy found in the tomb of king Tutankhamen in Egypt was wrapped in a red cloth, the results of chemical tests showed that the red color is an alizarin compound, a pigment extracted from madder [6]. Written records found that, natural dyes had been used in China in 2600 BC [3].

Classification of Natural Dyes Natural dyes can be classified based on their use, color produced, molecular structure, and others. Based on their use, dyes are classified into substantive dyes (can be used directly for coloring) and reactive dyes (cannot be used directly or which require auxiliary materials for coloring).

Natural dyes obtained from plants are very diverse, including red, yellow, blue, brown, and black; depending on the type and part of the plant and how to obtain it. Pigments produced from plants are about 2000 pigments, 150 of which have been utilized. In addition, dyes extracted from some plants can classified as drugs and some of them have shown antimicrobial activity [7].

### 4 Ecoprinting

According to [8] Sustainability design is a design that emphasizes satisfaction consumers in order to survive in the market in the long term, attaching importance to ecological factors as well as social factors when designing and manufacturing products, being environmentally friendly, and continuously improving in quality in accordance with social and environmental developments.

One way that has the potential to be developed from the ecoprint technique is to use plant waste material. This technique is made by reacting plant or vegetable waste which also acts as a mordant in the dyeing process with natural dyes on the fabric, through direct contact to give different effect from ordinary dyeing way [9]. So far, not much is known about the potential of this staining technique ecoprint using plant waste materials and natural dyes for fashion products.

For to carry out this technique, it is necessary to look for content that has the potential to be used as a dye material. The ecoprint coloring technique using natural dyes is not yet applied to fashion products. After reviewing the potential, the thought arises to raise the potential natural dyes and use them by developing ecoprint techniques with vegetable waste materials so as to create new textile motifs, through this method in the process, will not produce motifs and the exact same color. This is a separate finding that cannot be obtained in textile products conventional.

## 5 Creative Study Process

The basic idea in carrying out this research begins with the potential for vegetable waste that can be processed into natural dyes for the use of batik using eco printing techniques. Vegetable waste can be easily found in everyday life. If not processed, vegetable waste can cause damage to the environment and the accumulation of vegetable waste that is not recycled.

Vegetable waste can produce natural colors. This has the potential to be developed into natural materials that can print their own colors at the same time serves as a mordant. Through the processing of vegetable waste which is a development effort from the natural dye technique and the development of the ecoprint technique, the color of the reaction will be displayed natural dyes for vegetable waste, the form of various kinds of vegetable waste that has been well-composed according to good design principles.

## 6 Benefit of Research

The benefits for the community around Gunung Putri, which will be implemented, will get an extension that will be applied to the community in order to develop the potential of PKK mothers in the surrounding community. From the product or craft, it will be made as one of the characteristics that will develop handicraft products from the Lembang area itself as one of the batik crafts developed through the Gunung Putri community.

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