Zero-Waste Kebaya Design: Integrating the 'FRANGIPANI' Method to Enhance Sustainability and Utilize Leftover Lace

Faradillah Nursari[1], Regina Simamora M[2], Arini Arumsari[3]
Department of Craft, Faculty of Creative Industries,
Telkom University, Bandung, Indonesia
Corresponding author: faradillah@telkomuniversity.ac.id

ABSTRACT

The kebaya, a traditional Indonesian garment, has evolved to incorporate lace fabric in its design. However, traditional cutting and sewing methods may result in fabric waste, contributing to environmental degradation. Regarding this, the study seeks to develop a zero-waste model for kebaya that utilizes leftover lace, preserving its cultural significance while reducing environmental impact. Thus, the research proposes the FRANGIPANI method, a structured approach consisting of ten systematic stages of the design process that can minimize textile waste and promote sustainability in Kebaya production. This method aims to enhance organization and implementation in the production of kebaya while respecting Indonesia's rich cultural heritage. The primary goal of this research is to identify a more efficient pre-production system that minimizes textile waste. By focusing on sustainable practices, the research explores the potential for redesigning kebaya into a zero-waste model that utilizes leftover lace, thereby preserving its artistic value while promoting environmental sustainability.

Keywords: FRANGIPANI, Kebaya, Lace, Waste, Zero Waste Pattern

INTRODUCTION

Indonesia has a variety of national fashion heritage, one of which is kebaya. Kebaya is traditional Indonesian women's clothing in blouses or long-sleeved tops with front buttons, collars, and varied clothing lengths that depend on local culture (Hardisurya et al., 2019). As an effort to preserve the heritage, according to (the Decree of the President of the Republic of Indonesia Number 19 Year 2023 about National Kebaya Day), it is determined that 24 July is commemorated as National Kebaya Day. Therefore, Indonesian people need to maintain and preserve kebaya's existence amid the rapid development of fashion trends. Due to the rapid growth of trends, kebaya design has been beginning to transform. According to (Trismaya et al., 2022), designers started to design kebaya to a higher level by modifying ornamentation, aesthetics, and functionalities that were more developed than the function and meaning of kebaya in the past. The mentioned development and transformation became known as 'kebaya modification'. Kebaya became a luxurious fashion product often hand-made by various artisans for one design. Marketed as an exclusive fashion item by high-end fashion designers, the value of kebaya depends on

the material, design, and decorative elements.

Various aspects, including the development of material variations, influence the development of modified kebaya. The lace fabric is one of the popular variations of materials and is identical to kebaya. The lace fabric is a fabric material with a basic structure in the form of lace that is perforated like a net and transparent but has a variety of motifs, thin, smooth, and elastic so that it forms a curve and gives a floating effect (Arumsari, 2014). Due to its high demand, the lace fabric is available in various variations and is relatively easy to find in clothing industries. There are many types and qualities of lace in the fashion industry. Each price range has different quality and characteristics. Various laces are made of cotton, linen, or even silk. In Indonesia, lace is often made of synthetic yarns. This lace has a lower price point and is often used to make modern-style kebaya for middle-class consumers. Embroidery in floral and natural motifs is often added with metallic yarns or beads on the surface. Kebaya made out of lace is commonly used in formal or semi-formal events in Indonesia, such as graduation, weddings, or other ceremony. Women in Indonesia wear kebaya throughout different social classes and ages. Lace is often the common fabric choice for making kebaya, resulting in the high demand for lace fabric production to manufacture a kebaya. Furthermore, an uncreative approach to making fashion patterns results in up to 15% of fabric waste (Gwilt, 2020) that can damage the environment due to its synthetic materials. Therefore, an efficient and organized pre-production system is critical in reducing textile waste.

This research was conducted based on case studies on lace waste development (Arumsari, 2014) and the application of zero-waste pattern-cutting techniques on kebaya design (Garlufi & Nursari, 2018). Based on the two case studies, the researchers investigated the potential for lace waste to be remanufactured into a new reusable fabric sheet structure and its potential application in a kebaya fashion by applying the zero-waste pattern technique. The research employed the FRANGIPANI method so that the process runs systematically and the work results are the same as the initial idea (Mulyadi et al., 2022). The reason for using the FRANGIPANI method is to find the existence of an element of Taksu or the strength of the power (*Hyang Kuasa*) that is attached to the work process or the results of zero-waste kebaya work using lace waste, which remains to Indonesia's traditional dress culture (Arumsari, 2020). This research was conducted as an essential step in the craftsmanship process, inseparable from conventional Indonesian culture, and to discover the potential for a more efficient and organized pre-production system to reduce textile waste towards sustainability.

METHOD

This research aims to identify a more efficient pre-production system that minimizes textile waste for kebaya made of lace material. Exploration was conducted in this research by combining two methods. The first method is related to the design process and is done in stages, while the second method is to explore

possibilities for reducing waste from the production process. The method used in the design process is FRANGIPANI or The Secret Steps of Art Fashion. The FRANGIPANI method applies zero-waste fashion design at the production stage. This research is based on case studies about lace waste development (Arumsari, 2014) and applying waste pattern-cutting techniques to kebaya design (Garlufi & Nursari, 2018). The FRANGIPANI method makes clothes using ten systematic stages to make the design process more organized and carried out properly according to the initial design idea (Diantari et al., 2018). The FRANGIPANI method by Ratna Cora was used to find the potential for lace waste remanufacturing to become a new reusable fabric sheet structure and its potential application in kebaya by applying zero-waste pattern techniques. One reason for applying zero-waste kebaya redesign work that deserves to be presented and can be promoted continuously globally is the economic factor (Diantari et al., 2018). The data collection techniques used in this study were:

1. Literature Study

Data were taken from books, journals, and scientific articles to understand research objects related to lace waste development topics. With zero-waste pattern techniques, kebaya has become a fashion. This research uses literature on kebaya, zero-waste fashion, design, the FRANGIPANI method, and aspects of clothing design to understand each design stage.

2. Observation

An observation was made at the boutique "Ghani Kebaya" in Bandung to learn about the development of kebaya, the characteristics of lace fabric, and the waste from the production results.

3. Interview

The researchers interviewed the owner of the Bandung boutique "Ghani Kebaya," Mr. Rahyo, about the development of kebaya, the characteristics of lace fabrics, and lace waste from the production results.

4. Exploration

Exploration investigated the best possibilities regarding concepts, materials, and techniques used in the work process (Suharno et al., 2021). Creativity was also considered in this exploration process, referring to the creative efforts that focus on the product or what an individual produces, whether it is something new, original or an innovative combination (Rosilawati et al., 2023). This creativity emphasized the originality of the creative product. In this research, exploration was carried out in the form of a prototype. Lace waste design becomes a new sheet of fabric using the lace waste layering technique (Arumsari, 2014), based on elements of visual and principles to determine the potential of fashion form works such as redesigning zero waste using lace waste with high artistic value.

After data collection, there is a design process using the FRANGIPANI method, as Sukmawati et al. (2023) mentioned. Below are the stages of FRANGIPANI methods:

1. Finding the brief idea
2. Researching and sourcing fashion
3. Analyzing art elements of the fashion aesthetics in the work design
4. Narrating fashion ideas by two or third-dimension visualization

5. Giving a soul-Taksu to fashion ideas by making samples, dummies, and construction
6. Interpreting of singularity fashion to be shown in the final collection
7. Promoting and making a unique fashion
8. Affirmation branding
9. Navigating fashion production by humanist capitalism method
10. Introducing the fashion business

In this research, the application of the FRANGIPANI method started with a brief idea until the interpretation of singularity fashion was shown in the final collection. Using six out of ten stages in the FRANGIPANI method was aligned with the research objective of finding an efficient way to create kebaya kutubaru with leftover lace. The first six stages of the FRANGIPANI method were critical processes regarding the designs, and the result should determine how the last four stages of the FRANGIPANI method should be done.

RESULTS AND DISCUSSION

Kebaya and Lace Fabric Characteristics

The object of this research is traditional Indonesian clothing, namely kebaya. This clothing is traditionally worn as a top and over a sarong. However, in this research, the focus is on the kebaya. Kebaya is part of Indonesian culture that continues to develop occasionally. In the book Kisah Kebaya (Maulana, 2021), kebaya has been worn by Indonesian women since ancient times, both on official occasions and in their daily lives. The history or origin of kebaya is relatively unknown; most likely, kebaya came from other cultures, which mixed with local culture when trading occurred (Suryawan, 2014 deep (Maulana, 2021)). Nowadays, although fashion trends continue to evolve and change, kebaya is a fashion that can create beauty, elegance, and simplicity even after the kebaya is modified in such a way and joined with various elements of makeup and accessories (Maulana, 2021). In the book Kisah Kebaya (Maulana, 2021), it is explained that there are four types of kebaya forms, namely:

1. Short Kebaya

The short kebaya is a basic blouse with a front opening system and has a long fashion around the hips.

2. Long Kebaya

The long kebaya is a basic blouse with a front opening system and knee-length or more.

3. Kebaya Kartini

Kebaya kartini is a basic blouse with a front opening system and various collars whose right and left sides meet from the chest to the hips.

4. Kebaya Kutubaru

Kebaya kutubaru is a basic blouse with a front opening system and collar variations whose right and left sides are connected by a rectangular panel from the chest to the upper waist.

In this research, the type of kebaya explored is the kebaya kutubaru. This type of kebaya was chosen because it has design elements primarily identified with Indonesian tradition. The structure of kebaya kutubaru is also based on the principle of geometric shapes, thus allowing the possibility of exploring patterns in various forms while still

maintaining design elements that identify it as a kebaya kutubaru. Kebaya is a traditional clothing of Indonesia which, over time, has developed into various types. Designers adapt and innovate their designs with different design elements or materials. One common material used in the Indonesian kebaya is lace. Visually, lace has distinct decorative aspects that make it ideal for kebaya, such as the motifs and beads often embroidered on the surface. As explained by Mudarahayu et al. (2023), motifs or patterns on fabric also serve as a space for creativity for artists, which is related to the creative efforts of decorating lace as one of the most popular fabrics for modern kebaya. Lace fabrics in Indonesia is identical to party dresses and kebaya. Due to its high production demand, the lace fabric is available in various variations and is relatively easy to obtain in multiple clothing industries. An observation and interview were conducted to understand the use of lace as the primary material for most kebaya in Indonesia. The results of observations and interviews with the owner of the boutique "Ghani Kebaya" in Bandung, namely Mr. (Rahyo, 2023), about the characteristics of lace fabric are as follows:

1. Structure

The lace fabric is a material that has a basic lace structure and holes like a net. Its characteristic transparency gives it a floating effect (Arumsari, 2014).

2. Color

The fabric's variety of colors is quite diverse, with as many as 2 to ±10 color variations of each array of motifs. Types of lace fabric colors are widely produced, including dark colors such as black, light colors such as white, cool colors such as blue, green, and purple, and warm colors such as yellow, orange, brown, and other color variations.

3. Motif

Variations of motifs on the surface of the lace fabric are dots, lines, flora, fauna, and other shapes in such a way.

4. Texture

The texture of the lace fabric is distinguishable from the basic yarn of lace fabric, which is tulle and organza yarn. Lace fabric from tulle yarn as the base has a mesh texture and is soft and falling. Lace fabric from organza as the base has a slippery, glossy, smooth, and slightly stiff texture. The lace fabric texture is also influenced by the making of motifs, namely making motifs that are flat with lace fabric; motifs with threads that are stacked so that the texture of the motif is more embossed than other types of fabric; and motifs with the addition of sequins so that they have such a texture.

5. Thickness

Lace fabric thickness is based on the basic yarn of the lace fabric maker, that is, tulle and organza yarns. Lace fabric from tulle as the base has a thin thickness, while the lace fabric from organza yarn as the base has a slightly thicker thickness. Lace fabric thickness is also influenced by making flat motifs with lace fabric with a thin thickness, motifs with stacked threads with a slightly thicker thickness, and motifs with additional sequins with a relatively thick and heavy thickness.

6. Elasticity

Lace fabric elasticity is based on the basic yarn of the lace fabric maker, which is tulle

and organza yarn. Lace fabric with tulle as the base has little stretch elasticity, while the elasticity of the fabric lace with organza as the base does not stretch.

Zero-waste Fashion Design Approach

According to KBBI (Great Dictionary of the Indonesian Language) (2016), waste is the rest of the production process. In the fashion industry, textile waste is typically categorized into two types based on the production and consumption process (Rissanen & McQuillan, 2023). The first is pre-consumer waste from the production process, which includes leftover yarn, fabric scraps, or liquid waste from dyeing. The second is post-consumer waste, which consumers generate after discarding the fashion product. A way to reduce textile waste can be in sustainable design (sustainability) in a 3R way, which is Reduce, Reuse, and Recycling, or in other terms, redesign concept is redesigning an existing product (Rice, 2023). Another way to reduce textile waste that fashion designers can do is designing by using zero-waste pattern techniques. Zero-waste pattern is a technique or method of making patterns by minimizing the use of fabric so that not much fabric is wasted. This method is done by developing clothing products by integrating pattern cutting into the design process (Zia & Cecep, 2023). Zero-waste fashion design aims to significantly reduce pre-consumer waste by optimizing the pattern-cutting process. As supported by data from Niinimaki et al. (2020), this approach could cut down the fashion industry's annual creation of approximately 92 million tons of pre-and post-consumer waste.

Specifically, zero-waste fashion design targets a reduction of around 35% of pre-consumer waste from the fabric-cutting stage in the production process, demonstrating its practical benefits and alignment with sustainability goals. Fast fashion is also another cause of pre-consumer waste. According to Kurniadi et al. (2023), pre-consumer waste from affordable clothing in fast fashion that follows trends from high-end designers is one of Indonesia's most significant environmental pollutants. National waste in Indonesia reaches 170 thousand/tons per day, and 25% percent of it consists of pre-consumer waste, including fabric scraps leftover from fabric cutting in the production process. Most of these wastes are made from artificial materials that cannot decompose in landfills for a long time.

Historically, zero-waste fashion design has existed in traditional clothing globally in East and Western cultures. One example of this practice in the East is the Japanese Kimono. The term zero waste in modern fashion history was first invented by Paul Palmer in the 1970s, which came from his work on the modern waste industry focusing on upcycling. Rissanen & McQuillan (2023) mentioned that a traditional Japanese kimono is made by optimizing the length and width of the fabric with minimal cutting and no fabric waste. Additionally, the concept of using geometric shapes in creating clothes is also one of the reasons why the Japanese kimono is the best example of zero-waste clothing. In this research, kebaya, one of the traditional Indonesian clothing, is explored to learn the possibility of applying zero-waste fashion

design methods to achieve zero or less than 15% waste.

One distinct stage that differentiates zero-waste fashion design from the conventional process is using the pattern-cutting process as an ideation tool for the designer. McQuillan (2019) stated in her research that there is a separate role between the design and production processes in the fashion industry. This separate role is mainly applied in the mass production and ready-to-wear industry. It is an ongoing global challenge for the sustainable fashion initiative and the designers concerned about pre-consumer waste, such as fabric scraps.

Zero-waste fashion design uses the pattern-cutting process in the production stage as an opening to develop a creative way to visualize a design in its three-dimensional form (Rissanen & McQuillan, 2023). In the conventional fashion design process, this stage is usually done by sketching in two-dimensional forms. The three-dimensional form typically uses draping to visualize and analyze the relationship between fabric and design. Additionally, other approaches have been invented using modular or tessellation from fabric.

Rissanen and McQuillan (2023) explained that zero-waste fashion design has five primary criteria. However, depending on the design or fabric, there is room for changes or improvement during the process. The five primary criteria are appearance, fit, cost, sustainability, and manufacturability. Appearance is a criterion concerning the aesthetics of the clothing or visually pleasing for the user. Fit, however, is a criterion concerning the relationship between clothing and the body regarding comfort. Both criteria are carefully examined during the process of zero-waste fashion design due to their importance for the user. The last three criteria, namely cost, sustainability, and manufacturability, impact one another in the design process. Some designs are sustainable in their durability and longevity and possible to manufacture, but they also have a high cost. In other conditions, the material with the highest potential to develop as zero-waste clothing might not have the sustainability characteristic.

There are several approaches to zero-waste fashion design. According to Rissanen and McQuillan (2023), these approaches involve developing square-cut, tailored, draped, or hybrid systems of the mentioned approaches. The most common and basic approach is square-cut or geometric cutting, which optimizes the length and width of the fabric. The square-cut approach is the standard practice in producing traditional clothing such as the Japanese Kimono. The kebaya explored in this research, similar to the Kimono, uses geometric shapes from the fabric to create clothing with almost zero waste.

Combined FRANGIPANI And Zero-Waste Method In Redesigned Kebaya Kutubaru With Lace Leftover

Design stages in redesigning zero waste kebaya using waste lace with the FRANGIPANI method (FRANGIPANI, The Secret Stages of Fashion Art) by Ratna Cora has ten systematic stages. In this study, the FRANGIPANI stages were done in only up to

6 stages in the form of work design. The stages carried out were:

1. Finding a brief idea based on cultural identity is the stage in designing creative ideas for a cultural identity. The design ideas behind the concept of fashion creation can be taken from anywhere (Denissa, 2019). In this research, a zero-waste kebaya redesign was carried out using lace waste based on case studies on research on the development of lace waste (Arumsari, 2014) and the application of waste pattern-cutting techniques in kebaya design (Garlufi & Nursari, 2018) to introduce ideas and opportunities for sustainability. The design idea in this study also aims to preserve Indonesia's fashion heritage, especially kebaya, and develop sustainable kebaya clothing so that it continues to exist in the era of very rapid development of fashion trends.
2. Researching and sourcing fashion are the stages of research and collecting data to be applied to zero-waste kebaya designs using lace waste. The data found are:
    - Lace is a soft and light fabric with intricate structural designs of various motifs or patterns, such as batik-inspired or nature-inspired motifs. Chan (2020) describes lace fabric as a patterned, openwork, and delicate mesh fabric made by hand or machine using loops, knits, or interlacing thread. Lace variety is classified based on the manufacturing process. Hand-made Lace is needlepoint, embroidered, crocheted, knotted, bobbin, and tape lace. This type of lace has more value than machine-made lace due to its craftsmanship and yarn used in manufacturing.
    - In addition, hand-made lace is more time-consuming and often found in refined clothing such as sleeves, collars, or necklines. Today, lace is used massively, from high-end designers to custom-made clothes. Modern types of lace are made by machine, often with floral or geometric motifs on mesh or netting as the fabric base.
    - Netting is a mesh material identified by many geometric shape holes in its structural design (Chan,2020). Various types of netting in the fashion industry can be made from silk, polyester, rayon, or nylon fibers. Common types of netting used for clothing are tulle, bobbinet, and fishnet. These types of netting have different weights and thicknesses and are often used as a base or supporting garment. Netting is often associated with lace in modern kebaya designs. Lace with intricate patterns or motifs is cut by its shape and hand-sewn to a netting fabric such as tulle to elaborate the decorative aspects of the kebaya. Designers and crafters often cut Laces with different embroidered patterns or motifs and create a new composition with tulle as their base fabric. This practice is also a part of their design process, particularly in

modern kebayas, and generates more waste, such as fabric scraps, rather than the traditional kebaya made from one type of fabric.

- The lace fabric is quite identical in party dresses and kebayas. In garments, making short kebayas requires about ± 2-3 meters of lace fabric, while a long kebaya requires ± 5-8 meters of lace fabric with various modifications to its shape and ornamentation. However, cutting, making, and trimming up kebaya clothing by garments is not done creatively, wasting more than 15% of lace fabric. According to (Fitrah & Nursari, 2017), production carried out by designers produces more significant waste, ranging from 20-30%.
- The basic pattern of kebaya kutubaru is designed to show the body's silhouette. The central part of identifying the kebaya kutubaru is the open and narrow front part (Agista et al., 2019). In order to explore the possibility of redesigning it with zero waste fashion design, there is a stage of identifying the classic style of kebaya kutubaru according to Susilo, M. (2019) and Nagata & Sunarya (2023).
- Kutubaru: a middle panel joining the left and right side of the front opening. The width is usually narrower at the bottom of the kebaya.
- It has fitted long sleeves that show the shape of the women's arm and V-neckline with a Kutubaru panel in the middle of the front bodice.
- Traditionally, they are made with various materials, such as silk, brocade, lace, and cotton. Some are used to create a more feminine or formal look.
- They are usually decorated with bold patterns, beads, or embroidery.
- They are commonly worn with batik or songket as a bottom skirt.

3. Analyzing fashion elements is the stage of analyzing the aesthetics of art elements in the design of the work. The redesign of zero-waste kebaya using lace waste was done based on the visual elements on the mood board (figure 1). The aesthetic aspect of processing lace waste material has elements of visuals and principles. Based on the visual element, the lace waste material to be designed has:
   - Dot, a visual form of lace motif that the eyes can capture in the form of a collection of dots placed in such a way that they have an abstract visual.
   - Line, a visual form of lace motif, formed from a series of points side by side to form an organic line in the form of a curved line, in a way that is similar to abstract visuals.
   - Shape, the visual form of lace motifs, formed from several interconnected lines that form a graphic of a natural field with floral motifs.
   - Texture, the surface characteristic of the visual form of the lace motif, is formed from the arrangement of the

threads that make up the motifs on the lace. Several surface characteristics of pearl sequins are arranged in such a way that the lace texture has a real visual that can be seen and felt.

- Color, the reflection of light on the surface of lace fabric waste that the eyes can capture as a collection of mauve-colored lace waste.

Based on the preparation and design of several lace wastes selected to be processed into a new fabric sheet structure designed in such a way using elements of principles, namely:

1. Unity, the emphasis on size, shape, color, texture, and layout of repeated motifs to form a unity in their design (Kartika, 2007). The unity elements used have the same size, shape, color, and texture of lace waste motifs from each waste. Based on the preparation of several selected lace wastes, the layout of the first type of lace waste pieces is arranged in such a way together with the second type of lace waste pieces which provide unity with the other lace waste pieces starting from the size, shape, color, texture, and the layout of the preparation regularly.

2. Balance, the similarity between shapes in size, shape, color, texture, and layout of motifs facing each other, is considered, and attention is paid to the principle of balance in its design. The balance principle element used has a symmetrical balance (Kartika, 2007) with the layout of the lace waste pieces arranged in such a way with lace waste pieces giving each other unity with other lace waste pieces to produce an even visual from the right, left, top, and bottom sides of the new fabric sheet

Figure 1. Moodboard
(Source: Regina, 2023)

from the preparation and design of some lace waste.

The fashion elements of the kebaya kutubaru, redesigned from lace leftovers, were analyzed based on the visual design theory in a dress by Davis (1980) in Sari Yuningsih (2018). Visually, the Kebaya kutubaru was analyzed based on three aspects below:

1. Functional design refers to how a part or a whole design works. There are specific parts in kebaya kutubaru that have specific functions. One distinct part is the middle panel, or the Subaru, which joins the front left and right opening. Furthermore, this panel also functions as the identity of the clothing itself. Kebaya Kutubaru is often used as formal attire, and in this research, the leftover lace is strategically used to give it a more feminine look.
2. Structural design refers to the

construction of kebaya kutubaru and is also related to how it functions. Structural designs must agree with the clothing's function and the structure of the human figure as the wearer. The silhouette of kebaya kutubaru is designed to emphasize the wearer's body shape; however, there are limitations in the zero-waste patterns, which optimize the length and width of the fabric created from leftover lace waste.

3. The decorative aspect refers to creating a visually pleasing design from the structure or surface designs. In this research, lace waste is sorted based on several characteristics and laid so it is not visibly shown as a leftover or waste of laces. Decorative designs have a more aesthetic function. In the redesign process, decorative aspects in the structure of the kebaya are incorporated by organizing the colors of lace leftovers in balance and harmony.
4. Narrating fashion ideas by 2D or 3D visualization with zero waste fashion design is the stage after analyzing art aesthetics. Then, the next stage is the design of visual sketches from lace waste collections (Figure 5) and (Figure 6). Pieces of lace waste are arranged digitally on thin sheets of cotton fabric 150 cm x 100 cm using a Photoshop application as a prototype (Figure 2). The preparation of visual sketch design is based on the aesthetics of art from elements of visual in the form of points, lines, planes, textures, and colors, as well as the principle of visual in the form of unity and balance from the discussion of the previous stages. After the preparation of lace waste into new sheets of fabric, it enters the fashion sketch stage (Figure 3), and the zero-waste kebaya fashion pattern sketch (Figure 4), which has kutubaru kebaya production waste only 4.4% of the study (Garlufi & Nursari, 2018).

Figure 2. Prototype Digital Photoshop
(Source: Regina, 2023)

5. Giving a soul – Taksu to fashion ideas by making samples, dummies, and construction. It is the stage to provide "Taksu," which means soul or strength, by making samples, examples, and pattern construction from design sketches. At this stage, it is known that fashion is not just a body wrapping fabric to protect it. Still, fashion can become an artificial communication medium, which is a nonverbal communication medium that has the power to influence (Denissa, 2019). "Taksu" is a power that comes from the power and can be obtained by anyone who tries hard so that "Taksu" will be attached to the work

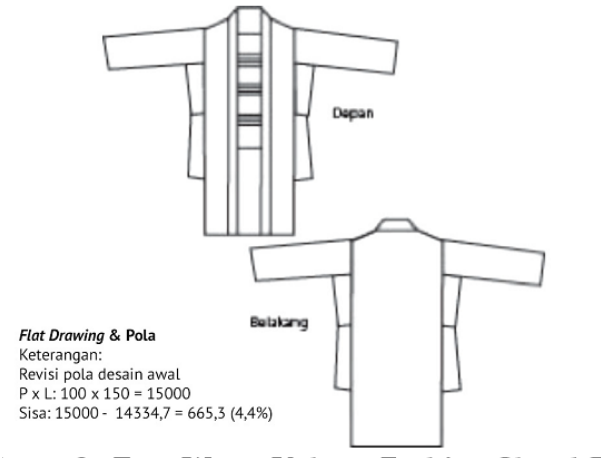

Figure 3. Zero Waste Kebaya Fashion Sketch
(Source: Garlufi & Nursari, 2018)

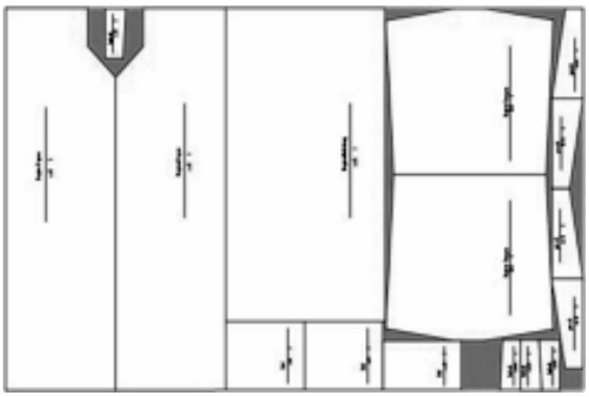

Figure 4. Zero Waste Kebaya Fashion Pattern Sketch
(Source: Garlufi & Nursari, 2018)

Figure 5. Lace Waste
(Source: Regina, 2023)

Figure 6. Lace Waste
(Source: Regina, 2023)

or work of the work (Arumsari, 2020). In order to have a soul strength that is also called "Taksu" in the zero waste kebaya redesign using lace waste, it is necessary to carry out the exploration stages of lace waste first with the characteristics of exploration carried out using lace waste with the basic yarn of making fabric from tulle yarn, as follows:

- Waste one is mauve-colored, with dot and line motifs, textured, embossed, and slightly thick motifs; it is 180 cm x 100 cm and has a fabric shape with many holes measuring 12 cm x 8 cm (Figure 5).
- Waste two is mauve-coloured, with motifs of floral-shaped fields that are textured, embossed, and accompanied by several pearl sequins; the fabric is quite thick and heavy, and the waste is 190 cm x 55 cm (Figure 6).

The exploration process uses techniques in "Cutting the Lace—Layering Motif—Sewing Machine"

Figure 7. Layering Lace Waste
(Source: Regina, 2023)

(Arumsari, 2014). Waste is arranged by layering on the base fabric, with thin cotton fabric measured 150 cm x 100 cm as the first layer. The second layer uses waste piece 1 (Figure 5). The third layer uses waste piece 2 (Figure 6) with lace fabric which has been cut out in such a way in some parts of the motif and then arranged, in layering, and sewn in such a way (Figure 7) to produce a real work in the form of sheets of cloth lace new that can be reprocessed into a kebaya. Design processing is carried out based on the aesthetics of art on zero-waste kebaya redesign works using lace waste, which has aesthetic elements in the form of elements of visuals and principles that are designed in such a way as to produce a new form of fabric sheet that the composition and rhythm of the shape of the fabric and its motifs arranged regularly. Motives from lace waste are organized in an orderly row with an organized sparse based on the aesthetics of the art at the previous stage.

From the stage of design ideas, stages of research and data collection, aesthetic analysis of art, visual sketching, and design process prototypes to the stage of realizing the idea of designing a kebaya redesign with zero waste using waste lace, of course it requires awareness and hard effort in the entire systematic work process so that the design results are based on the initial idea of the design. The effort of every work process to produce a work in the form of zero-waste kebaya redesign using lace waste cannot be separated from the power of Hyang Kuasa. The purpose of the work that cannot be split is to preserve Indonesia's fashion heritage, especially kebaya, and develop kebaya fashion that is sustainable to continue to exist in the era of the rapid development of fashion trends, as well as the processing of optimal and valuable work systems can undoubtedly find the potential for more efficient and organized pre-production systems to reduce textile waste towards sustainability (sustainability). Total awareness, hard effort, optimal processing of the work system, and value in the process of work to the results of work for realizing the idea of zero waste kebaya redesign using lace waste indeed has an element of "Taksu" or the strength and soul of the power that is inherent in every process of work and its results.

6. Interpreting of singularity fashion to be shown in the final collection, which is the stage of realizing design ideas that have function values based on the results of experiments that have been

Figure 8. Redesign Results
(Source: Regina, 2023)

carried out. The results of learning the experimental concept of designing a kebaya kutubaru redesign with a zero-waste pattern using lace waste (Garlufi & Nursari, 2018) can be seen in (Figure 8). The results of the work process show that the body and fashion design that has been created then become a medium that can be used as a content image to launch messages, images, and ideologies about widespread phenomena (Denissa, 2019) so that fashion products, especially kebaya redesigns that have been explored have elements of Taksu. The Taksu element is attached to the zero-waste kebaya redesign work using lace waste because the work process finds the potential for optimal and more efficient pre-production system processing to reduce textile waste towards sustainability. The element of "Taksu" is linked to the work because it has a value that contains a message in the form of an image of beauty, elegance, and simplicity that cannot be separated from the heritage of traditional Indonesian fashion, especially kebaya. Zero-waste kebaya redesign work using lace waste with the FRANGIPANI method is an fashion work with a unique design and high artistic values in the form of "Taksu" elements or the strength and soul of Hyang Kuasa.

CONCLUSION

Using the FRANGIPANI method is efficient in fashion design contexts, mainly to preserve the heritage of traditional clothing such as kebaya, not only as a fashion product but also as an art form. The term fashion was used to describe a type of clothing designed with specific considerations and has more artistic value rather than commercial value. FRANGIPANI method was initially used to design clothing that emphasizes aesthetics but needs to be more specific about sustainability. The general idea of the ten systematic stages of designing fashion has much potential to develop into a more comprehensive method, especially when sustainable approaches in fashion design are incorporated into the design stages. In this research, the FRANGIPANI method's flexibility allows for combining other methods or theories during the design stages. Zero-waste fashion design is one method incorporated in the design stages, specifically in the fourth stage, narrating fashion ideas by two and three-dimensional visualization. There is a similarity between the zero-waste fashion design method and

the fourth stage in the FRANGIPANI method. Both methods significantly mention the visualization of the design using two or three dimensions or combining both. Based on its ten stages of systematic and more organized design, the FRANGIPANI method can find the potential for a more efficient and organized pre-production system to reduce textile waste towards sustainability. This research mainly discusses design processes due to their importance in understanding how a design method with a core of tradition can combine with modern concepts relevant to today's trends.

Kebaya Kutubaru is a versatile research object explored, analyzed, and evaluated using different aspects of design and aesthetics. Furthermore, this research explores redesigning kebaya kutubaru, made out of machine-made lace fabric with tulle as a base fabric, which is widely used in Indonesia across different socioeconomic hierarchies.

The core of FRANGIPANI methods came from an understanding of the fashion design process in the West, which meets the traditional values of Indonesia. FRANGIPANI gives the element of "Taksu" or strength and soul that comes from the Hyang because it is attached to every stage of design ideas, research and data collection, aesthetic analysis of art, visual sketch, the design process prototype, then the stage of realizing the design idea formed in zero waste kebaya redesign using lace waste which has high artistic values. "Taksu" is attached to works because it contains soul, strength, beauty, elegance, and simplicity in traditional Indonesian fashion. The process of optimal and effortful work with full awareness and valuable work becomes a new soul to preserve Indonesia's cultural heritage amid the rapid development of fashion trends. Further research is needed to continue the FRANGIPANI method until the tenth stage, which introduces the fashion business. Sustainability in this research primarily focuses on a systemized pattern-cutting exploration and method to reduce waste. Through the FRANGIPANI method, there is a potential for developing a holistic approach to sustainability, focusing on material, production process, and business model.

***

BIBLIOGRAPHY

Arumsari, A. (2014). Community Empowerment Through Lace's Waste Development. *Arts and Design Studies IISTE*, *26*, 77–86. www.iiste.org

Arumsari, A. (2020). *Penerapan Design Ethics Pada Industri Fesyen Kelas Menengah Di Bali*.

Agista, T. P. C., & Handajani, S. (2019, August). Social Movement and Kebaya Design Trends in the Borderless World. In *1st Annual Internatioal Conference on Social Sciences and Humanities (AICOSH 2019)* (pp. 95-99). Atlantis Press.

Big Indonesian Dictionary (KBBI). (2016). Badan Pengembangan Dan Pembinaan Bahasa, Kementerian Pendidikan, Kebudayaan, Riset, Dan Teknologi Republik Indonesia.

Decision President Number 19 Year 2023 about National Kebaya Day, Pub. L. No. Nomor 19 Tahun 2023, Keputusan Presiden (KEPPRES) SK No 180090 A (2023).

Denissa, L. (2019). Fesyen Akademik sebagai Alternatif Kebaruan dalam Budaya Populer. *Panggung*, *29*(2).

Diantari, N. K. Y., Arimbawa, I. M. G., & Sudharsana, T. I. R. C. (2018). Representasi Gangsing Pada Busana Wanita Retro Playful. *Prabangkara Jurnal Seni Rupa Dan Desain*, *22*, 90–92.

Chan, C. (2020). Textilepedia: The Complete Fabric Guide. Hong Kong: Fashionary.

Fitrah, D. H., & Nursari, F. (2017). Perancangan Busana Zero Waste Dengan Teknik Draping Pattern Making Pada Pola Kimono. *Atrat*, *5*, 276–285.

Garlufi, R., & Nursari, F. (2018). Potensi Penerapan Teknik Zero Waste Pattern Cutting Pada Desain Kebaya. *Atrat*, *6*, 227–234.

Gwilt, A. (2020). *A Practical Guide to Sustainable Fashion-second edition: Vol. PB 978-1-3500-6704-2* (Second edition 2020). Bloomsbury Visual Arts.

Hardisurya, I., Pambudy, N. M., & Jusuf, H. (2019). *Kamus Mode Indonesia* (Vols. 978-602-412-677–3). PT Kompas Media Nusantara.

Kartika, D. S. (2007). *Estetika* (Pertama, Vols. 979-3784-19–9). Rekayasa Sains Bandung.

Kurniadi, C. A. P., & Githapradana, D. M. W. (2023). Utilization of waste fabric for ready-to-wear deluxe unisex clothing design with fabric manipulation technique on Kamisado brand. In *Sustainable Development in Creative Industries: Embracing Digital Culture for Humanities* (pp. 415-419). Routledge.

Maulana, D. (2021). *Kisah Kebaya* (Vols. 978-602-06-3610–8). PT Gramedia Pustaka Utama.

Mudarahayu, M. T., Sedana, I. N., Remawa, A. A. G. R., & Sariada, I. K. (2021). Estetika Bentuk Busana Pada Lukisan Wayang Kamasan. *Jurnal Panggung*, *31*(2), 93-104.

Mulyadi, N. T., Nursari, F., & Viniani, P. (2022). Pengaplikasian Konsep Zero Waste Fashion Design Dengan Teknik Engineered Print Pada Busana Ready to Wear Wanita. *Moda*, *4*.

Nagata, T., & Sunarya, Y. Y. (2023). Perkembangan kebaya kontemporer sebagai transformasi budaya. *Jurnal Seni dan Reka Rancang: Jurnal Ilmiah Magister Desain*, *5*(2), 239-254.

Niinimäki, K., G. Peters, H. Dahlbo, P. Perry, T. Rissanen, and A. Gwilt (2020). "The Environmental Price of Fast Fashion,"Nature Reviews Earth & Environment 1: 189–200.

Rahyo. (2023, November 22). *Karakteristik Kain Lace*.

Rice, S. (2023, March 1). *The 3Rs explained (Reduce, Reuse, Recycle)*. Travelife Accommodation Sustainability.

Rissanen, T., McQuillan, H. (2023). Zero Waste Fashion Design. United Kingdom: Bloomsbury Publishing.

Rosilawati, R., Suparli, L., & Suherti, O. (2023). Relevansi Ide, Konsep dan Bentuk dalam Proses Kreatif Karya

Tari 'Gandrung Liwung'Inspirasi Merak. *Jurnal Ilmiah Seni & Budaya Panggung*, *33*.

Suharno, Fitra, A., & Ganefiani, S. (2021). Semiotika Busana: Model Konstruksi Tanda dalam Penciptaan Busana. *Panggung*, *31*.

Sukmawati, N. K. A., Sudharsana, T. I. R. C., & Sari, D. A. P. L. (2023). Samudra Amerta Analogi Tradisi Muang Jong sebagai Inspirasi Penciptaan Karya Busana dengan Style Feminine Romantic. *Bhumidevi: Journal of Fashion Design*, *3*(2), 33-45.

Susilo, M. (2019). *Evolusi Kebaya di Indonesia*. Yogyakarta: Andi Publisher.

Suryawan, D. S. (2014). *Kebayaku* (Vol. 9786020310732). Gramedia Pustaka Utama.

Trismaya, N., Shahab, Y. Z., & Siscawati, M. (2022). From Glamorous to Everyday Use: Kebaya as the Medium of Women's Self-Expression. *Wacana Journal of Social and Humanity Studies*, *25*(3).

Zia, & Cecep. (2023, June 13). *Wujudkan Pola Minim Limbah dengan Zero Waste Pattern di Magang Instruktur LKP Tata Busana*. Vokasi.Kemdikbud.Go.Id.