

Community Empowerment Through Lace's Waste Development

Arini Arumsari

School of Creative Industries, Telkom University, Jalan Telekomunikasi No. 1, Bandung, Indonesia

*E-mail: arini@tcis.telkomuniversity.ac.id

Abstract

Fashion trends develops and evolves from the said factors can describe pre-historic or social occurrences that effects the way people dress and how it changes periodically in accordance to the social conditions and other influencing factors above. All fitting rooms from time to time can tell stories and reflect trend cycle on how people think and live. Therefore, clothes are inseparable from human's life and it keeps changing accordingly to the era. The blooming of fashion trends in Indonesia, especially in big cities such as Bandung make the public demand for clothing and accessories are very high. So in the production process, the fashion industries produce waste or residual textile materials that can't be used anymore in the process of production. However, based on the observations results, the textile waste still can be processed into products as good as those produced by the fashion textile materials that in the intact categories.

Lace was chosen because based on previous observations, lace's waste are easily obtainable in many places due to the production of clothing lace fabric which is widely used to make most women Indonesian kebaya and have kebaya needed in a variety of interests. And based on the results of studies that have been done before, lace fabrics(lace)has a strong aesthetic characteristics and has a range of advantages that are not owned by the rest of other textile materials.

By doing this processing of lace's waste as the main material is expected to maximize the potential and also improve the aesthetic value that can become the alternative and enriched types of textile materials for high-quality fashion accessories products. And is expected to provide variation in terms of the increasingly prevalent and enthuses the fashion industry today. The lace's waste development for textile products is also be expected to become an alternative solution to waste reduction that caused by the industry's clothing or fashion accessories. As well as it can encourage domestic small industries that are expected to be the main producer in the processing of textile waste.

Keywords: Lace's waste, eco-fashion, structure textile design

1. Introduction

The existence of the waste generated from all human activities with various industrial activities to improve their quality of life, can't be separated from the negative impact on the ecological balance and environmental sustainability. Awareness of the importance of maintaining the balance of ecosystems has become a global issue that should be taken seriously because the impact was fatal to the safety and health of the man himself.

Lace chosen as the main material in this study because based on the previous observation, the lace's waste readily available in various places due to the production of clothing. Lace fabric which is identical with the kebaya and party dresses. Lace fabric is widely used to make kebaya for most of Indonesian women. Kebaya is needed in a variety of occasion. For example wedding ceremonies, ceremonies, parties, school graduation or graduation events and other special occasion. So the use of this fabric is very high. And based on the results of experiments on materials that have been done before, lace fabric has advantages in terms of aesthetic value.

Aesthetics here according to the AA. Djelantik (1999) is "a science which studies all things related to beauty, learning all aspects of the so-called beauty". So if aesthetics is synonymous with beauty can be said that the lace fabric has many advantages in terms of beauty that is not owned by another textile materials, such as the main trademark of this fabric is transparent but has a motive. Because the basic structure of lace / lace holes, it makes the character very thin material, smooth and transparent. Giving an drift effect, creating a bouffant silhouette that other construction materials don't have it.

It is expected that lace which has such characteristics still can be used, although it has become a 'waste' from the clothing production. If it's only become trash and thrown away so it's bad for the environment without providing any benefit to the environment and the community.

Survey and observation areas for this study will be limited in Bandung which is deemed to have represented the major cities in Indonesia with the rapid development of the fashion industry. According to M Ridwan Kamil, the founder of Bandung Creative City Forum (BCCF), "in Bandung, the conducive climate is available in the field of creativity, and support people who are open to new ideas. So that Bandung has a reputation that is widely known as a tourist destination city,the location of the leading universities, the center of fashion and clothing, as well as a

creative city that is supported by a diverse of creative resources".

The rest of the processing of textile materials are also expected to be an inspiration for small home industries to become major players in the textile waste material further processing. Because the basic assumption in this study is the lace's waste fabric as the raw material is very easy to obtain, but with a good and diligent handmade processing the domestic industry without requiring heavy & complicated industrial machinery and, the results obtained are expected to contain a variety of value-added which can increase the economic value of the product.

Based on the above idea, problem formulation can be described through questions as follows:

1. Is fashion production waste, especially lace fabric waste, able to be produced and used of its quality and quantity, not merely disposed as it is?
2. How to produce and use waste of fashion production so that it can provide a product that is as much as good as the whole piece of the textile previously?

2. Laces waste's classification

The method used is the experimental approach to find the most optimal techniques in processing the lace's waste. From initial experiments that have been done before, the lace's waste will be first classified into several types such as found in the table below:

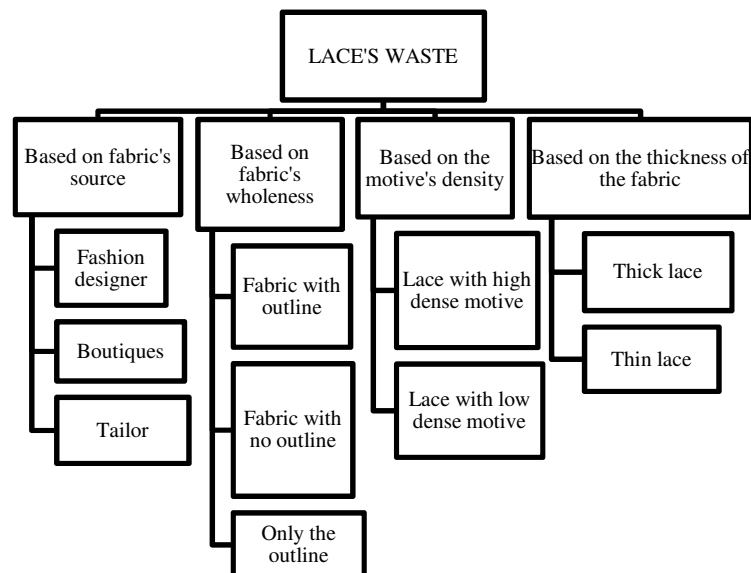


Figure 1. Classification of lace's waste

From the classification above the lace fabric waste processed with variety techniques such as surface design and structure design. But each classification has a different treatment, because each type of fabric is determine what technique that allows to apply. Not all techniques can be applied to all kinds of lace waste.

Here are the characteristic's classification of lace waste:

1. Type and characteristic of lace waste (lace)

Basically, characteristic of the lace is the same with whole piece lace; thin, soft and transparent, has flying effect, create silhouette with bubble / volume. The difference is on the size. Lace waste size will be smaller that the whole piece lace.

2. Production process and treatment condition on lace waste (lace)

Lace waste is waste of whole piece lace that has been cut in pieces and passed various production process so that its size won't be as big as whole piece lace and its fabric structure has changed.

3. Conditional analysis of lace (lace)

Lace waste cuttings will become problem if it is directly produced without further process, therefore here is the process required. Because when it is produced, based on previous research, those cuttings have potential to create new material with interesting texture and color combination.

Based on observation result towards fashion industrial condition in Bandung as a source of waste lace producer, it is gained that this fashion industry consists of several economy classes. In each class, quantity and quality of lace waste is different, so that it influences waste earning required on the next research steps that are experiment, design and market evaluation.

Fashion industry of waste lace producer usually uses lace waste they have to apply it to various products. For instance, wedding shoes, dress combination and application for cloth or bag. This lace does not pass structural process, its function is merely as accessories.



Figure 2. Shoes product of Adity Boutique, uses lace waste

2.1 Classification of Lace Waste Based On Fabric Source

Table 1. Analysis of characteristic and potential of lace waste based on fabric source

Source	Characteristics	Strengths	Weaknesses
<i>Fashion designer</i>	Usually called as paris lace, because it was made in France. Not a local product. Its texture is soft, with unusual and complicated motif and high elasticity.	It is good when it still a whole piece fabric, especially for kebaya, it can fit well on the body.	When it is already in form of cuttings, its characteristic becomes almost the same with cheaper lace.
Boutique	Consists of imported lace such as from France, Japan, and China. Also various lace with various details or embellishment such as embroidery, etc	When it is in a whole piece it is very good to be worn as kebaya. It looks complicated and exclusive.	When it becomes waste cuttings, it is almost the same with cheap lace and those various embellishments make it difficult for experiment process.
Kebaya Tailor	Various lace waste.	It is simplify the process with various technique	-
Regular Tailor	Less diverse lace waste	Simple lace that easy to process	Less diverse of variation of motif and color.

2.2 Classification of Lace Waste Based on the Wholeness of the Fabric

Table 2. Analysis of characteristic and potential of lace waste based on fabric wholeness

Wholeness of Fabric	Characteristic	Strengths	Weaknesses
Lace with outskirts	There is outskirts on the cutting fabric, usually it uses for lower level of kebaya collar.	Outskirts can be used like lace.	Usually it comes in small size and few number of cuttings
Lace without outskirts	There is ordinary motif on the fabric cutting	Consists of various fabric that possible to be processed with various experiments	-

2.3 Classification of Lace Waste Based on Motif Density

Table 3. Analysis of characteristic and potential of lace waste based on motif density

Motif density	Characteristic	Strengths	Weaknesses
Lace with dense motif	Lace that has dense and evenly motif.	Fabric structure is stronger and evenly at each part when it cut in pieces	-
Lace with rarefied motif	Lace has rarefied motif	Motif can be taken / cut	Fabric structure is not strong

2.4 Classification of Lace Waste Based on Motif Density Fabric Thickness

Table 4. Analysis of characteristic and potential of lace waste based on fabric thickness

Fabric Thickness	Characteristic	Strengths	Weaknesses
Thick Lace	Lace is thick because it has detail / embellishment added in the process of the fabric making. Like embroidery, sequin, etc.	Looks interesting, complicated and exclusive.	Those detail / embellishment make the process difficult. For instance, because of the thickness makes the sewing needle broken when it is sewn.
Thin Lace	This lace does not have additional embellishment. Motif on fabric is made together with the whole fabric structure with jacquard technique.	Its structure is thin but fabric strengths are better and evenly. Simple to be conducted any experiment.	On several fabric, evenly motif and without accessories becomes monotone.

3. Experimentation process

In context of eco-fashion which is a clothing and fashion products that have been produced using environmentally friendly products in the process, includes organic products and clothing. Eco-fashion products include re-use materials like an old clothes or even use other materials produced from recycled plastic bottles, soda cans, and others. Eco-fashion does not always have to be made using organic fibers. Eco-fashion products also include products recycle or make-over and vintage clothing. Because with reuse-ing, we explore the function and add overall value. Right now in developed countries, especially in the United States, has many green designers who use recycled products and materials to produce their works. Both works haute couture and ready to wear. Many of the world's fashion label that has been using vintage fabrics for this season, changing the old textiles to be unique and original. The result is the desired appearance without damaging the earth, good style without the destruction of nature. In Indonesia, like designer Priyo Oktaviano, Ichwan Toha and that makes the product recycle clothing.

In this study the Eco-Sustainable Design method that taken is Eco-Redesign. Whish means that by identifying the problems caused by this lace waste and seek solutions from the negative impact caused by the processing of lace waste fabric so it does not just become trash. Although the basic elements of lace material can't be changed, will remain a polyester material that can't be parsed by nature, but by making use of it, the advance of the lace waste is expected to give much more value to the community.

From Eco-Redesign strategies, some strategies used in this study which are cyclic; reusing; recycling and upgrading, and safe (non-toxic). Lace fabric waste material is processed in a way that the produces is minimal waste or no waste material anymore, but it can be re-used material with good quality material in a high quality fashion products. Previously, lace waste just discarded after being used up in the production process. So now it collected and processed with various design to create a new material that has a good quality and it's product can provide economic value and great benefit to society. The process of sewage treatment in this study is also minimal or may not use additives or harmful environmental advocates such as resins, synthetic textile dyes, glue and other woods chemicals that harm the environment. So hopefully this research can be an example for the community, in addition to utilizing material that had previously been waste, also to not use materials or other

materials that harm the environment arbitrarily so bad for nature and the environment in the design and production process.

Experimentation process of lace waste is done with various structure design techniques such as weaving, knitting techniques, felting, forgings and various other techniques. Structure design techniques is the process of forming decorative / design on fabric that made simultaneously with the formation of the fabric structure. This technique is necessary to create a new structure in the processing of this waste lace. Due to the condition of waste lace that usually cropped in small sizes to have a good structure and strong for the next material for women's fashion products. Unlike intact fabric condition that are ready to be produced or if it will be processed first to directly use the design surface processing techniques. Surface design techniques is the process of forming decorative performed after the formation of the fabric structure. It consist of techniques such as batik, tie dye, embroidery, printing, painting and others.

The main technique used in the experimentation process is layering technique. Layering-sewing technique is essentially the utilization of residual structure that is transparent and lace fabrics in the form of small pieces of fabric so that a new sheet with a thick texture. Tools and materials needed for this experiment is the main piece of lace fabric as the main material, sewing machine, sewing thread and scissors. However, it is possible to add or complementary material or techniques for further experimentation process for the effectiveness of experimental results. This technique is done by stacking small pieces of fabric as lace fabric sheets that it becomes larger. Bringing together pieces of fabric stretcher is to sew with a sewing machine. And stitching machines became the main supporting structure of the fabric material.

3.1 Layering Experiment

3.1.1 Layering Experiment 1

1. Working process: Layering of the various pieces of lace - sewing machine with a lines pattern - cutting - sewing machine to form accents.
2. This experiment can be applied to almost any type of lace, both the dense motive, tenuous, thick, thin, fringe or not. Only if there is a piece of fabric on the thick details, it makes the fabric become too thick, and it will complicate the process of sewing machine needles machine because it will be broken.



Figure 3. Examples of layering experiment

3.1.2 Layering experiment 2

1. Working processes: cutting the leaf pattern - layering - sewing machine.
2. This experiment can be applied to a piece of lace fabric with tight motive. So the new fabric sheet structure also strong and evenly.

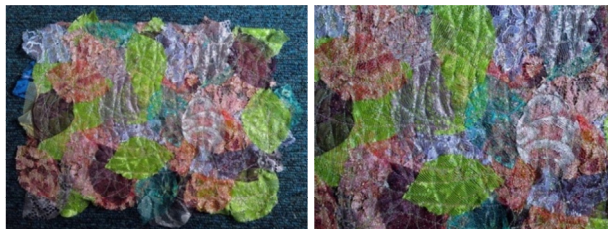


Figure 4. Layering Processes Experiment 2

3.1.3 Layering Experiment 3

1. Working processes: cutting the lace - layering motif - sewing machine.
2. This experiment can be applied to a piece of lace fabric with a pattern of sprawl and strong. Both in terms of aesthetics as well as the structure of the fabric. So that the motif can be cut / separated from the original fabric but can form a new fabric structure.



Figure 5. Layering Experiment 3

3.1.4 Layering Experiment 4

1. Experimental process: yarn making - layering - sewing machine.
2. Tools and materials: the lace waste fabric, scissors, wax paper, sewing machine
3. This experiment can be applied to a piece of lace fabric with a pattern of sprawl and strong. Both in terms of aesthetics as well as the structure of the fabric. So that the motif can be cut / separated from the original fabric but can form a new fabric structure.



Figure 6. Layering experiments 4

3.2 Ruffles Experiment

1. The working process: cutting lace - crease with hand sewing (tack) - sewing machine.
2. This experiment can be applied to cuts lace fabric that has a lining ornaments.



Figure 7. Ruffles eksperiment



Figure 8. Lace waste that had a ornamental edge

4 SWOT Analysis Towards Product Design Process of Lace Waste

After done with experiment and product design process of this lace waste, this research will also study opportunities and obstacles possibly appear if this product is projected can become a new commodity in the community. This research uses SWOT analysis (*Strength, Weakness, Opportunity, Threat*) of product of lace waste.

SWOT analysis is formulated after it is done with various field data collecting through direct field observation, interview with involved parties in the intended production process and market; and questionnaire is conducted towards the intended market. Questionnaire is spread to 60 consumers of two boutiques in Bandung at Adity Boutique, located in Jl. Taman Cibeunying Utara No.4 and Happy Go Lucky House, located in Jl. Ciliwung

no.14.

Some of Adity Boutique's products are clothes, bags, shoes and accessories like necklace, bracelet, brooch, etc. Price estimation of those product starts from Rp 50.000 to Rp. 300.000. For clothes, price estimation starts from Rp 150.000, clothes by order and special design can reach millions rupiahs. Price estimation for bag and shoes, starts from Rp 200.000 to Rp 700.000.

Some of Happy Go Lucky House's products are clothes, bags, shoes and accessories such as necklace, bracelet, earrings and etc. Price estimation for accessories starts from Rp 50.000 to Rp.500.000. For clothes, price estimation starts from Rp 200.000, clothes by order and special design can reach millions rupiahs. Price estimation for bag and shoes, starts from Rp 400.000 until hundreds of million rupiahs. Both boutiques are considered meet the intended market segment in this research, that is young woman consumers from upper economy class in big cities in Indonesia.

Analysis conducted is elaborated as follows:

1. *Strength*

Main power of this lace waste product is the promising economy value that quite high, because of the low primary material cost, where it can be gained for free. This can be seen from the comparison of its production cost with reasonable selling price. Selling price prediction is gained from data collecting has been conducted towards the consumers.

Production cost = Primary material cost + bag crafter + accessories / additional material cost + transportation, etc

Production cost = Rp 0 + Rp 50.000 + Rp 20.000 + Rp 10.000

Production cost = Rp 80.000

From the production cost amounting Rp 80.000, reasonable selling price, according to the consumers, for bag from this lace waste is Rp 500.000 – Rp 1.000.000. Therefore, it is proven that the product can have a high value and has a big difference with the production cost of the product if exclusivity and uniqueness of the product are maintained.

In addition, from primary material availability, lace waste is easy to get from clothes production sources and also available in various colors and motifs, so that in the production process the result has variation.

And based on the experiment and design process have been conducted, working technique and tools are easy to get. Generally, tools used are scissors and sewing machine. So that in addition to lace waste, there are scissors, sewing machine, sewing needle and pins. It does not require big and complicated equipments or production machine.

2. *Weakness*

Weakness of this product is its comfort and durability that still needs attention, because based on the questionnaire, comfort level of lace waste product is still bad compare to its attractiveness, uniqueness and exclusivity. It is because most of the making process is using scissors and stack technique, so that its texture becomes thick, stiff and rough. Therefore, it requires special treatment for this lace waste process.

Other weakness is that it is required craftsman's skill to maintain product uniqueness and exclusivity to be acceptable by intended market.

3. *Opportunity*

Opportunity to develop this research is very big not merely because of the availability factor that varies in terms of color, texture, motif and detail so that the possibility to make design composition or combination of this lace can keep on developed.

Other opportunity is that eco-fashion is popular among many parties, so that the community is directed to appreciate, nurture the nature and be eco-friendly

4. *Threat*

Existing threat of lace waste availability by clothes producers is not consistent each month, even if it is accumulated each year it shows improvement.

Other fashion product is the competitor need to be considered. Also the community's taste towards fashion product is very dynamic so that it needs sensitivity and skill to catch the market demand.

5. **Strategy of Lace Waste Process Development in the Community**

To develop research of lace waste process in the community, it needs some strategies to use existing potentials in addition to study weakness and threat anticipations. This strategy drafting is required to be done in several approaches by analyzing influencing factors of research development and application in the community. From the observation has been done previously by SWOT analysis strategy can be drafted in form of development strategy table elaboration that becomes a design of fashion product design strategy by processing lace wastears

the primary material.

The strategies are as follows:

1. Opportunity-Strength Strategy, by utilizing the potential in this research and the result product to create other opportunities both in marketing and development.
 2. Opportunity-Weakness Strategy, by considering weakness of factor of this research to be anticipated by giving correction opportunity.
 3. Threat-Strength Strategy, by overcoming external threat through potentials of the research factor.
- Opportunity-Weakness Strategy, by considering self weakness and also can overcome external threat possibly appear.

Tabel 5. Development strategy of lace waste process in the community

Internal Factor	Strengths (S) 1. Since its primary material is free, so that its production cost is low, product resulted has a high economic value. 2. This lace waste is easy to get and available in various color and motif.	Weaknesses (W) 1. Its comfort level and durability still need attention because the result texture is thick, stiff and rough. 2. Lack of skill or craftsman to maintain product's uniqueness and exclusivity.
External Factor		
Opportunities (O) 1. Various lace availability, so that product result can keep on developed. 2. Eco-fashion is popular among parties	Strategy of Opportunity Strength (SO Strategy) 1. Improve design so that it can lead to a product that has good quality according to the market demand. 2. Build cooperation and network in product marketing that in accordance with intended market segment.	Strategy of Opportunity Weakness (WO Strategy) 1. Provide skill training for the community that has potential to process the lace waste. 2. Set a cooperation with parties in tools and technology utilizing sectors to improve product comfort and durability.
Threats (T) 1. Lace waste availability is not consistent each month. 2. Other fashion product is product competitor that need to be considered.	Strategy of Threat Strength (SI Strategy) 1. Search for the right method to collect and store primary material to enable it to be easy to get. 2. Improve product quality and uniqueness that become the power of the product to raise its selling value.	Strategy of Threat Weakness (WI Strategy) 1. Making research development model for the community to overcome weaknesses of potential community. 2. Do various exhibition and search for product market network.

These strategies are Figures of what can be done as possible research development attempts so that it can be used by the community that has potential to do lace waste process to make it become a fashion product that has high selling price accordingly to the intended market segment.

Experiments process of lace waste and it's product design process is done with consideration of design elements, such as color, texture, shape, proportion and others. Experimentation process focuses on the expertise and skills in the processing of raw materials that exist in an environment, to be used as objects and aesthetic value in order for the environment. Experimentation is focused on the production process, including: making techniques, collaborating construction materials, finishing and its application to the development of fashion product design.

7. Frame of Optimizing Development Model of Lace Waste Process in the Community

Below diagram explains stages in processing lace waste that is possibly applied in the community after SWOT

Analysis and research development strategy have been conducted. Development model of this research is estimated can be applied in general community with classification of woman from 15 years old above or equal with the age of Junior High School student. Considering the experiment techniques that are very easy to be done like cut the fabric using scissors. Target can be started from middle low economy class. Because this research development is expected to become one of solutions for economic improvement, considering primary material is free, but with good craftman skill and marketing can result in product with high economic value, and production tools required are not big and complicated that needs big amount of investment. Because based on the experiment process and product design, tools that are always used is scissors, pins, sewing needle and sewing machine, where all of them are daily sewing equipments. High enthusiasm towards textile processing or hand skill is also required to enable to produce a good quality product so that it can have high economic value and is acceptable for consumer.

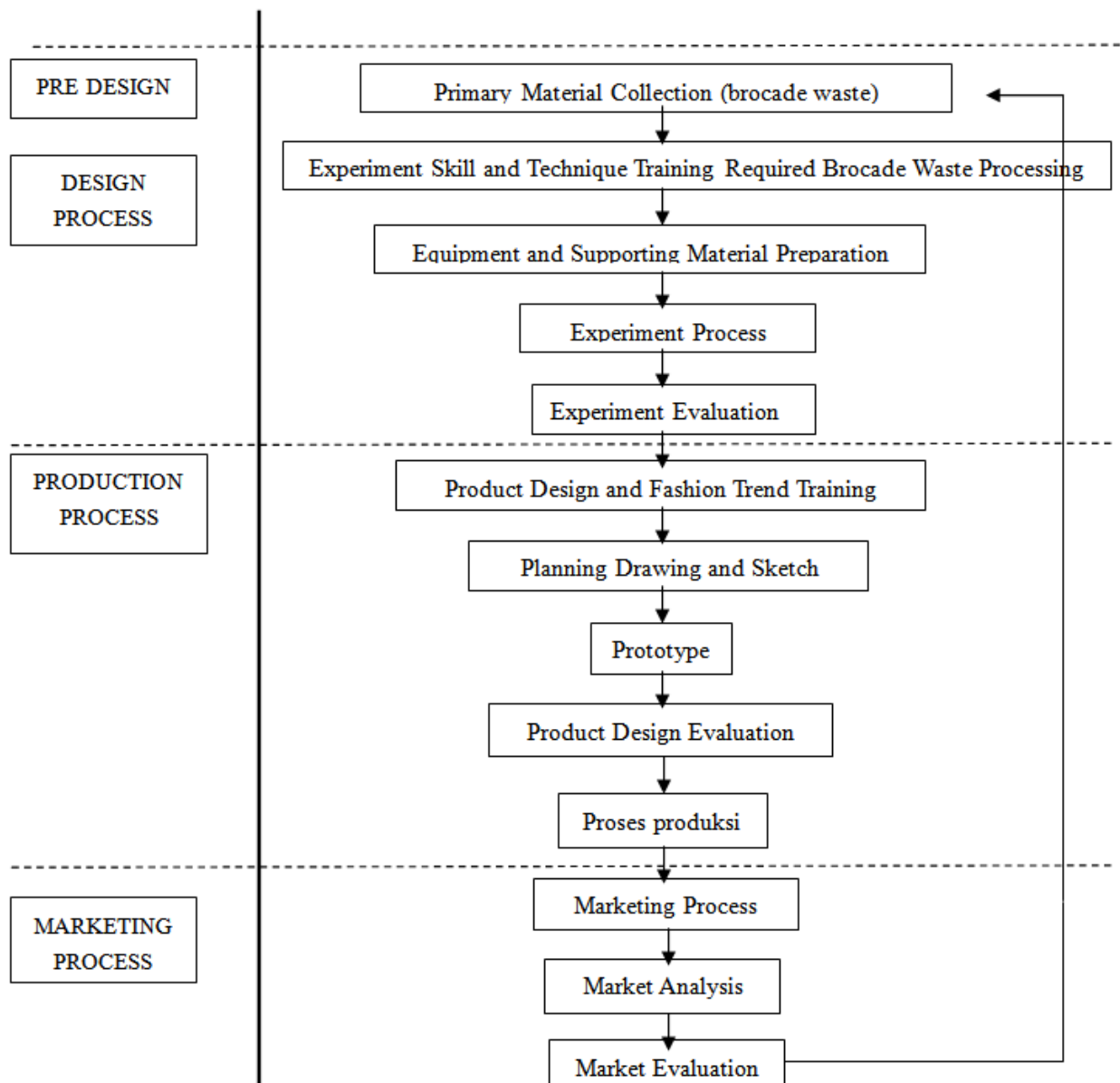


Figure 9. Model of brocade waste development in the community

8. Conclusion

Based on the research that has been done, it can be concluded that:

1. Lace fabric as the main material is readily available in various places due to the production of clothing lace fabric which is identical with the kebaya and party dresses, as well as demand and high demand for this fabric so that the fabric is produced in a very varied kind.
2. And based on the results of this study, lace fabric has a strong aesthetic characteristics and has a range of advantages that are not owned by the other textile fabric waste, with the main trademark of this fabric is transparent. Because the basic structure of lace / lace holes, it makes the character very thin material, smooth and transparent. Giving effect to drift, creating a bouffant silhouette (bubble) is not shared by other construction materials.
3. Economically, the use of waste material lace can improve production efficiency as raw materials obtained free of charge so as to reduce the cost of raw materials and also the overall production costs. But the end product can be high cost. This occurs if the aesthetic value and the exclusivity of the product can be maintained. Although the waste generated by the industry is sometimes only considered negative impact, but if we observed further to the industry, there is still a lot of waste that can still be used. So in the fashion industry, which are many and varied types and class in society. Produce the quantity of waste that not a few others and if just thrown away will only has a bad impact without any value for society.
4. Product development by utilizing waste products had been carried out and can be carried out by various segments of society. Not only can be done by big industry. Processing the rest of this lace can be done by small home industries to become major actors in the subsequent processing of the waste of the textile material. Because of the results of research conducted in addition to the rest of lace material is very easy to obtain, as well as the processing is done is not necessary machines and also a large or complex processing techniques are easy fabrics like basic sewing techniques and a variety of handmade techniques .

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Arumsari. Arini. Arini was born in Bandung – West Java - Indonesia, on April 4 1985. Arini holds a S.Ds (bachelor degree) in Textile Craft from Institut Teknologi Bandung (class of 2003, cum laude) and M.Ds (master degree) from the same university (class of 2010). From 2011 she joined Telkom University as Lecturer of Fashion & Textile Design Program. After 6 months she served as the Assistant Manager of Research and Public Services. After her 2 years career as a lecturer and assistant manager, she served as the Head of Program of Fashion & Textile Design until now. Her major field in teaching and research consist of surface textile design, manipulating fabric and fashion accessories design. In addition to teaching, Arini is a fashion designer of her own fashion brand named LiltSpring and Arinish.

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