

An Exploration of *Tutut (Pilla Ampullacea)* Shell Waste as Basic Material of Accessories Production

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Abstract. Processing of materials in jewelry either new or pre-existing is highly developed. Starting from material, examples of natural waste materials. One of them is *tutut* or often called Rice field snail. Rice field snail or *Tutut* in Bahasa (*Pilla Ampullacea*) is a type of freshwater snail and is easily found in rice fields, ditches and lakes. The population is very large because of rapid its poliferation make the farmers worried. It would destroy rice plants. Snail fields eat the bottom of the rice fields and cause the rice to destroyed. As a result many farmers suffer losses and try to overcome snail fields such as snail fields as food and eradicate them with pesticides. Based on that background, this research recommend some processing and experimenting *tutut*'s shell waste. The method used in this research is experimental method which is done by exploring the material physically and chemically in order to get visual approach. The potency of the product of *tutut*'s shell waste will be analyzed as the result of this reseach. Based on that background, this research recommend some processing and experimenting with physical approach to explore *tutut*'s shell waste into the basic material of accessories in terms of managing and reduce the waste.

Keywords. *Exploration, Waste Exploration, Reduce Waste, Snail Shell, Accessories, Jewelry*

1 Introduction

Waste and how to manage it now become an increasingly urgent problem if there is no good handling and can lead to changes in the balance of the surrounding environment. The amount of waste causes various problems either directly or indirectly for the population around the stacking area, in the absence of further processing and waste utilization.

Based on the compounds, the waste is grouped into two, namely inorganic and organic (Jenie *et al.*, 2007). Inorganic waste such as plastic, paper, and rubber. While organic waste or more often called wet garbage is a type of waste that comes from the living body so easily decomposed and can be destroyed naturally. Examples are vegetables, meat, shell, fish, rice, and grass / leaves / twigs. This research is focused on the processing of organic waste because in the fulfillment of daily needs, humans will not be separated from organic waste. One of them *tutut* or often called paddy snails.

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Tutut lives in shallow waters and overgrown with grass with relatively slow water flow, such as rice fields, trenches and lakes. The population is very large because of rapid its poliferation make the farmers worried. It would destroy rice plants. Snail fields eat the bottom of the rice fields and cause the rice to be destroyed. As a result many farmers who experience losses and try to overcome the snails field such as snails fields as a food ingredient and eradicate with pesticides. In addition, if during the rainy season comes will leave the shell so that the farmers will remove the shell because they considers will be dangerous (Wardhono, 2012). From various ways of dealing with farmers, they only focus on eradicating and controlling the snail's population alone, it has never been thought of to overcome this pest while obtaining economic benefits by processing *tutut* shell waste into a product.

Based on the background of the problem about the quantity of *tutut* shell waste that has not been utilized, the authors see the potential to develop waste products from the *tutut* shell by doing the exploration process. It aims to provide another approach in the creative process to obtain the most optimal form of a material used. The process involves a physical approach (Physical Treatment) by adding some chemicals around us to know various kinds of information about visual form and uniqueness of certain materials used.

Thus, the exploration by using the availability of natural waste which is so abundant one of the *tutut* shell waste. So making souvenirs with *tutut* shell waste material is one idea that can be developed into the latest innovation in making souvenirs that can then be traded on an area or tourist attractions in Indonesia.

1.1 Problem Identification

- *Tutut* or paddy snail shell wastes increasingly accumulate if not processed optimally.
- Need to do experiments to find ways to process *tutut* or paddy snails' shell waste.
- Create a design of souvenir products in the form of earrings, necklaces and bracelets from the exploration of *tutut* shells waste.

1.2 Scope of the Research

- Natural products only focused on organic waste one of them is *tutut* shell waste.
- Material exploration conducted by physical and chemical handling. The chemical handling eliminates the distinctive aroma of the shell. While the physical handling is the coloring on the shell of a *tutut* or paddy snails
- The final result of material exploration in the form of souvenir products.
- Types of souvenir products is not a set but unit product such as earrings, necklaces and bracelets.
- Making of the form can be adjusted with the data results of questionnaires and opinions from the public regarding souvenir products.

1.2 Design Objective

The objective of the design is as follows:

- General Objectives: (1) Apply scientific product design and (2) Knowing how to process natural waste.
- Specific Objectives: (1) Lifting local wisdom through material exploration and (2) Reduce the amount of waste, especially in the case of *tutut* or snails field shell waste.

2 Literature Review

2.1 Waste

Waste is a material that is no longer used and has a negative impact for the surrounding community if not managed properly. Based on the form of waste is divided into 3 kinds: (1) Solid waste, (2) Liquid waste, and (3) Gas waste (Jenie *et al*, 2007).

While based on the type of composition according to Subardi *et al* (2009), the waste is grouped into two types, namely: (1) *Organic Waste* and (2) *Inorganic Waste*

2.2 Material Exploration

Exploration is a field investigation activity for information and data gathering conducted for the benefit of research and information for interested parties. Material exploration can be applied to the world of handicraft business after going through the process of theoretical and practical studies. Exploration activities are conducted to determine the production process of a product to be produced. There are several exploration techniques that can be used by changing the material structure such as chemically, biologically, and physically. (Palgunadi, 2008).

2.3 Souvenirs and Accessories

Souvenirs are something that can be taken home by the tourists when visiting an area. Souvenirs can usually be key chain, jewelry, displays and others. Indirectly souvenirs can also be used as a promotion of a tourist attraction. Accessories are an important thing in dressing whether someone has a minimalist style, glamor, etc. Accessories have a variety of types, such as earring jewelry, rings, necklaces, bracelets, brooches, beads and pins. Most people who use accessories to harmonize with the clothes they use or to make the appearance more different than their usual. (Avantie, 2010).

2.4 Empirical Data

2.4.1 Tutut Shell (*Pilla Ampullacea*)

According Wisnu Wardhono (2012), paddy snails (*Pilla Ampullacea*) is a kind of freshwater snails and easily found in rice fields. The shape resembles a golden apple snail (murba), but the paddy snails have a dark green shell to black color. The height of the shell can reach 40 mm while the diameter is 15-25 mm snail type is smaller when compared with other types of snails. The paddy snails or *tutut* has seluk as many as 6-7, slightly convex and the last seluk has a larger size. A round shaped golden snail shell and short tower, with the thickness of five to six twists close to the tower. Based on this research, golden snail shell contain 5.8% water content; protein 2.19%; and minerals 15.20%.

These animals are widely consumed in different parts of Southeast Asia and have good nutritional value because they contain high enough protein. Snail field or *tutut* is a paddy snail which is one of the pests of rice plants. Paddy snails can live in ponds, irrigated rice fields. Golden snail burrows on moist soil during the dry season. Golden snail can survive for up to 6 months by immersing itself in the ground (Wardhono, 2012).

2.4.2 Waste Management of Tutut Shell

Some regions in Indonesia have not been embraced for the development of local potential (Lantu, Pulungan & Yudiarti, 2017). In the community there is no process of waste management in this shell of *tutut* or paddy snails. The shell of *tutut* in the original form of residual consumption of the citizens directly thrown away by the merchant to the dump without any processing done. This can cause pollution of the surrounding environment and can hit anyone's foot if stepped on. Moreover, if within a certain period of time it can negatively impact the existing ecosystems around the disposal area.

2.4.3 Initial Ideas of Design

Based on the previous research, it can be concluded that the waste of *tutut* shell can be used and recycled easily by using materials that are around us. In addition, this exploration aims to obtain new materials that can be processed and recommended for materials making souvenir products. The initial idea of souvenir product design is jewelry with fun nuances. In this souvenir is not made a set but in the form of jewelry units such as bracelets, earrings, and necklaces made from natural waste of *tutut* shell and can give a special impression on the tourists who buy it. Making these souvenirs is not made a set because if someone buys or uses jewelry rarely a set but rather they prefer to buy the unit and mix and match the souvenir. That's because the souvenirs only as a support when dressed to look more interesting.

3 Research Methods

The methodology of this research is a qualitative approach. Qualitative research aims to obtain an overview concerning something according to human views. Qualitatively research is used due to the experimental process is carried out with natural conditions and certain treatments are implemented. Thus the qualitative research can be used to examine the condition of natural objects with triangulation (combined) data collection techniques as the validation of results.

The experimental method was chosen because of the research conducted in connection with exploration, so that in the process researchers need to collect field data in the form of trial results to the material to be processed.

4 Result

4.1 Material Characteristic



Fig. 1. *Tutut* Or Snail Field and Exploration Process Result Color IV

Tutut or paddy snails are taken from the rice field area where the shell has been empty because these animal have left its shells during the rainy season arrived. *Tutut* used in the process of exploration is blackish brown in color with a length not exceeding 1.5cm and the

shell of the *tutut* has a diameter of 15-25mm. The uniqueness of this material is the shape of its shell like a rounded cone and pointed ends.

4.2 Material Exploration Process

Table 1. Material Exploration Process

Materials	Steps	Conclusion
<ul style="list-style-type: none"> • <i>Tutut</i> waste that has been cleaned. • Caustic soda • Dish soap. 	<ul style="list-style-type: none"> • Choosing material. • Washing with running water and soap. • Mix the ingredients available with 2 tablespoons of caustic soda and 6 spoon dish soap and then soak for 1 week. • Washing with dish soap 2 times for the chemical to disappear. • Soap with dish soap for ½ day • Drying for 1 day without direct exposure to sunlight. 	<p>At the end of the result obtained on <i>tutut</i> shell aroma is lost but the color of the shell slightly turned brown but there are still black color on the shell. In addition part of the dirt on the shell is completely disappeared and the shell skin is smooth but when it is held the shell is directly wrecked.</p>

4.3 Color Exploration Process

The process of coloring at this stage by using pilox samurai with bronze color. Bronze has a metallic brown bronze-like character. In the exploration process results of the shell on the 5th process dried for 5 hours then refined with fine sandpaper and then dipped the resin.

From the coloring results obtained that the color is more clearly visible and not easily peeled of. And the bronze color makes the shell of the *tutut* look luxurious and does not seem cheap. The advantages of this color process does not easily fade.

4.4 Exploration Process of Paint's Smell Removal

In the process of exploration this time aims to remove the scent of pilox on the *tutut* shell so that a person who uses this jewelry product does not cause any side effects. The process of removing the aroma on a bronze-colored pilox is done by immersion with a dishing soap and a washing soap. This immersion process is done for 30 minutes for the smell of pilox lost. After that the shell is dried by drying in the sun. This drying is done simultaneously to test the resistance of the shell whether at the time the product has been in krum paint will still experience cracks or not.



Fig. 2. Left-right: immersion Process, sunlight Drying Process (Source: Author, 2018)

4.5 Additional Process

This farther process is carried out by mixing flakes of *tutut* or paddy snails shells with catalyst and clear resin. Flakes of *tutut* shells are used is a mixture of *tutut* shell that has

been given with bronze color with *tutut* shell that is not colored. Mixing is done because if using only bronze serpihan then it will damage the resin and make the resin broke.

The first step of this farther process is to add the resin which has been mixed with the catalyst into the mold then give the *tutut* shell serpihan then cover it back with resin. Drying the resin until dry. During drying the color of resin will turn into a whitish green color. The color change occurs because of the color of pilox in the shell. The final form of this exploration is box and oval.



Fig. 3. Left-right: *Tutut* or Snail Field demolition Process, drying resin (Source: Author, 2018)

4.6 T.O.R

– Character

The material to be produced has a character that is the absence of natural odor found in the shell of the *tutut* and the remaining dirt contained in the shell is completely lost.

– Shape

The final shape is a natural shape in the shell of a *tutut* that has a conical shell shape and tapered backward.

– Dimension

The resulting dimension is a natural dimension in the size of a *tutut* shell that does not exceed the size of 1.5cm because the material will be processed into jewelry products, so the size can be adjusted to the product to be made.

– Color

Color is the first thing a person can see. Therefore, in this exploration time, the emphasis on the color of the shell is studied. The color of exploration material in the form of jewelry colors such as gold and red. But it does not close the possibility if the exploration process can be given another color to look more attractive.

– Texture

Texture is something related to touch senses. Based on the results of texture experiments to be sought in the form of a smooth texture without any streaks at all on the shell that will be processed into jewelry products. The texture was previously found in the shell material of the *tutut* only if there is an error when the exploration of the texture will change naturally because of the chemical factors used.

– Placement

The final result of this exploration process will be placed for the manufacture of products that can support the appearance of women. Placement of *tutut* shell material will be more dominant so that people who see will understand that the jewelry is the result of the utilization of natural waste.

– Environment

Experiments have a purpose as an effort to countermeasure the waste of *tutut* shell that mostly found around Jatigede dam. The countermeasures are aimed at utilizing waste so as not to be thrown away and make it unsightly

5 Discussion

5.1 Point of Interest

In this research type of souvenir with the concept of fun and playful by taking the form elements from nature, and this product can be used by various circles either adolescent to adult with range of age 17-30 years old. The product from the basic material of *tutut* shell is expected to be able to compete with various jewelry products that already exist in the market with price 150.000 but has an interesting design.

The exploration and create valuable ideas sometimes occur by the Divergent and Convergent Thinking as it is consciously or unconsciously happened (Yudiarti *et al*, 2017).

Making these souvenirs is not made in a set but in the form of jewelry units such as bracelets, earrings, and necklaces. In making because the ring is not made in the design of this jewelry will be combined with waste from *tutut* or snail field shell. If the resulting waste is made for ring products then the result of the ring model will be large and leave the impression less interesting. In addition, the public opinion if the ring has a large model does not have the impression of luxury and expensive.

This design uses the results of exploration that have been done in the previous stage that get the result that the material of *tutut* shell given the color of bronze gold. And the exploration results are made accessories with basic materials of brass and copper. Brass is a mixture of copper and zinc metal, usually 67% copper and 33% zinc. Brass substitute of metal mulia is good enough. While copper is a metal that is easy to be formed either by heat or not. From the two materials will be coated by gold so that the product has an expensive impression and does not cause irritation for its users.

5.2 Supporting Material

The process of designing a jewelry product consists of various elements in the form of supporting materials. Supporting materials such as basic materials that can be used to become accessories such as necklaces, bracelets and earrings. The development of the world of accessories allows the use of supporting components jewelry making one of them in the form of copper and brass material. Copper is the first metal material used by humans as equipment, weapons to accessories products such as earrings, necklaces and bracelets. Copper is an alternative material often used by craftsmen because of the affordable price and easy to form metal either with heat or not. In addition to copper the supporting material for jewelry making is brass. Brass is a mixture of copper metal with zinc and has the advantage that looks shiny like gold. Brass is easily formed, has the glistening looks, thus giving the impression of using gold.

Apart from these two materials will be given a gold coating with the purpose that the color is more durable with cheaper tag but has identical quality to gold. The coating process is the final part of the production process of a product. The process is done after reaching the final form or after the process is done. Therefore, the coating process is included in the category of finishing work or often also called the final stage of the work of an accessory product.

5.3 Product Presentation



Fig. 5. Left-right: Product 1, product 2 (Source: Author Data, 2018)

6 Conclusion

In the designation of the jewelry product this time used materials from *tutut* shell that was given additional materials such as copper, brass, rhinestone and freshwater pearls. The use of those materials was to make the jewelry to look glamour when it is used. In other hand, based on the result of jewelry analysis in the market, there were no souvenirs using material from *tutut* shell so it eased the author to do the designation process.

Product designation made from field snail (*tutut*) shell this time, the problem solving obtained was processing the result of exploration from *tutut* shell waste into new innovation in the forms of earrings, necklace and bracelet. The final shapes were natural while from *tutut* shell was adjusted to natural shape such as flower pattern. Final shape was adjusted to the concept theme of the designation determined before.

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