

The Creation of Furniture Products Design From Stem Waste of Sugar Palm Tree (*Arenga Pinnata*)

I WAYAN SERIYOGA PARTA¹, I WAYAN SUDANA², HASDIANA³

^{1,2,3} Lecturers of Arts Education Studies Program, Engineering Faculty of
State University of Gorontalo, Indonesia
Email: seriyoga@ung.ac.id

Sugar Palm tree (*Arenga Pinnata*) is one of potential natural resources that can be used as a based material of furniture products. But, this sugar palm tree potential hasn't exploited maximally and only throws away as a waste that contaminates the environment. On the other side, woods that have been used as based material of furniture products are getting rare and expensive. Based on that problem, this research is aimed to design new furniture products models that exploit the stem waste as a prominent based material. This research uses experiment method with steps: 1) finding and formulating concepts of furniture products design creation based on analysis towards the stem waste of sugar palm tree characteristics; 2) implementing of finding concepts to become furniture products models from stem waste of sugar palm tree. As a result of the research, it is found "tube" concept and *tatah* carved concept as a right concept to be applied in creation of furniture products from stem waste of sugar palm tree. Implementing of "tube" concept and *tatah* carved concept is made successfully in shape of some furniture products design such as: table model, chair model and wardrobe model. Realization of these designs has concerned with the use of sugar palm tree as a prominent based material. According to the result of evaluation, all of these designs are deserved to be made. So, it is concluded that to anticipate the qualified wood as a based material of furniture products, we can use stem waste of sugar palm tree as alternative based material.

Keywords: Creation, Furniture Products, Stem Waste of Sugar Palm Tree.

Pohon aren (*Arenga Pinnata*) merupakan salah satu sumber daya alam yang potensial digunakan sebagai bahan baku produk mebel. Akan tetapi, potensi batang pohon aren itu belum dimanfaatkan secara maksimal dan hanya terbuang menjadi limbah yang mengotori lingkungan. Di sisi lain, kayu yang selama ini dimanfaatkan sebagai bahan baku produk mebel keberadaannya makin langka dan mahal. Bertolak dari permasalahan itu, penelitian ini bertujuan untuk merancang model-model produk mebel baru dengan memanfaatkan limbah batang pohon sebagai bahan baku utama. Penelitian menggunakan metode eksperimen dengan langkah-langkah: 1) menemukan dan merumuskan konsep-konsep penciptaan desain produk mebel berdasarkan analisis terhadap karakteristik limbah batang pohon aren; 2) mengimplementasikan konsep-konsep yang ditemukan ke dalam bentuk model-model desain produk mebel dari limbah batang pohon aren. Dari hasil penelitian ditemukan konsep "tabung" dan konsep ukir *tatah* sebagai konsep yang tepat untuk diterapkan dalam penciptaan produk-produk mebel dari limbah batang pohon aren. Implementasi dari konsep "tabung" dan konsep ukir *tatah* berhasil dibuat beberapa model desain produk mebel yaitu model meja, model kursi, dan model lemari. Perwujudan desain-desain tersebut telah mempertimbangkan penggunaan limbah batang pohon aren sebagai bahan baku utama. Berdasarkan hasil evaluasi, semua desain tersebut dinyatakan layak untuk diproduksi. Oleh karena itu disimpulkan, bahwa untuk mengantisipasi makin langkanya jenis kayu yang berkualitas sebagai bahan baku produk mebel, dapat digunakan limbah batang-batang pohon aren sebagai bahan baku alternatif.

Kata kunci: Kreasi, produk mebel, limbah batang pohon aren.

INTRODUCTION

The existence of qualified wood as a furniture product based material is getting rare. Tim Elspat, (1999: 2) said that naturally there are only 14,3 June left of high quality woods, and the rest of 85,7 June are low qualified woods. It is also stated by Suranto (2002: 31) that among of four thousands kind of woods in Indonesia, it's only 15% - 20% that have good long lasting quality, and the rest of 80% - 85% are low long lasting quality woods. The rare condition of good quality wood is not only impact to the price of the furniture, but also for continuity of this industry, to fulfill national demand and export commodity which absorbing a lot of employees.

To anticipate the rare amount of quality wood that threaten continuity of this furniture product, it needs to be found an alternative based material in order not to depend to high quality of wood. Some research show that based materials of handicraft products, including furniture product, are very less, in amount and quality (Pangestu, 2008: 114).

Sugar Palm tree (*Arenga Pinnata*) is a kind of palm tree that its stem claimed to be used potentially as based material of unique furniture products. The high of sugar palm tree is about 15 – 20 m and its diameter is 60 cm (Lempang, 2012: 40). This information indicated that stem volume of this sugar palm tree can be used as based material of large furniture products. The productive life of this tree is about 25 years old, and after that, this tree is slowly drying and dead (Fitriani, Sunardi & Ferry, 2012: 16). It's mean that the opportunity of using this sugar palm tree to become furniture products is after 25 years, because it still produces *nira* if we harvest it before 25 years. In old condition, stem of this tree is very solid and strong, and can be used to make axe handle, hoe handle, and others (Puasi, 2012). This information shows that old sugar palm tree is very strong and solid to be used as based material of qualified furniture products.

The existence of this sugar palm tree that guarantee continuity of furniture products is good enough, in short or long period. Baharuddin and Ira Taskirawati (2009: 93) said that sugar palm tree is an original Indonesia plant that can be seen everywhere, from low until high land. It lives above 1400 m from sea surface. In Gorontalo province, spreading of this tree is fair enough. According to data of Gorontalo Province Plantage Department in 2015, it spreads

covering three regencies, such as: Gorontalo, Bone Bolango, and North Gorontalo. It's all about 842 ha. It's excluding others regencies (Gorontalo City, Pohuwato, and Boalemo) that have no quantitative data yet, but factually can be seen from amount of sugar palm tree around river edges, gardens and jungles as wild plants.

There are a lot of unproductive sugar palm tree in Gorontalo province because of its age and dead. But it's only little amount of that unproductive sugar palm tree is used by communities as fence, handle of household furnishing and fire-wood. Rest of the tree is keeping stand-drying for years and become wastes that contaminate its environment. Whereas, those sugar palm's wastes have a chance to be used as based material of furniture products, such as: table, chair, wardrobe, etc.

In order to find out an alternative based material of furniture products using wastes of those trees, it's need to be found and formulated creation concepts of furniture products that appropriate with sugar palm tree characteristic and designed furniture product models based on that concepts, so we can make innovative furniture products that deserve to be produced. Based on that idea, this research is aimed to: 1) finding and formulating creation concepts of furniture products from stem waste of sugar palm tree; 2) implementing of finding concepts to become furniture products models from stem waste of sugar palm tree. The result of this research will be useful in supplying new furniture models for craftsman or furniture industry to be produced and decreasing use of woods as based material of furniture products.

RESEARCH METHOD

This research uses experiment method that is done in two steps, such as: 1) finding and formulating concepts of design creation with verbal characteristic through analysis towards waste of sugar palm tree characteristics; 2) implementing of verbal concepts to become visual design shape, that is done thorough design experiment of furniture based shape, design of ornament shape, and illustration design until it becomes new models of furniture product design from stem waste of sugar palm tree.

Data which are needed in this research are data about characteristics of sugar palm trees' stem waste. Techniques of collecting data are: 1) observation

towards physic characteristics of sugar palm trees' stem waste like: fiber, color, texture, shape, and shining value; 2) characteristic testing of sugar palm trees' stem waste such as: weight, strengthness, measure, size, fiber, working quality, and shrinkage; 3) book study as secondary data to complete or support primarily data and strengthening result of analysis. For data validation, it is done with triangulasi technique method that is comparing or checking off the similar data with collecting different data method.

Analysis data interactively, following data analysis model Huberman and Milles (Denzin & Lincoln *ed.*, 2009: 592), that is data reduction, displaying data and drawing of conclusion/verification. Data reduction is done by making data category, taking and embracing data which are needed based on research focus, and abandoning irrelevant data. Reduction result of the data is displayed, arranged in systematically order, so the structure is clear and can be understood. When the displayed data is felt enough and the structure is clear, next we can do a conclusion.

The Concept Of Furniture Products Design From Sugar Palm Tree's Stem

Concept is a thinking abstraction or ideas as a based of implementation. Concept as abstract idea that belongs to mental construction is stated through terms in form of symbol or words (Alfian, 1997: 1). Function of the concept is to clarify a phenomenon or as a guide in doing something. In this research, concept is stated as thinking abstraction or ideas which is stated verbally in form of operational statements as a based or a guide in creating design that is furniture product design. That concept is developed and formulated according to the stem waste characteristics of sugar palm tree which is analyzed through physical characteristics, likes: shape, measure, fiber, color, texture, hardeness, shrinkness, strengthness and working quality.

According to the result of the research, it's is found that physical characteristics of sugar palm trees' stem waste are: 1) round shape like pipe; 2) stem diameter size is about 30 – 55 cm and thickness of stem bone is about 2 – 3 cm; 3) solid and undulating fiber; 4) it has brown black color with white dots; 5) rough and shining texture; 6) its hardeness is categorized as hard wood type; 7) low shrinkness; 8) its strengthness is categorized as strong wood; 9) working quality is categorized as a difficult wood type to be processed and finished. Based on those

physically characteristics, the weaknesses from stem waste of sugar palm trees if used to be furniture products are difficult to be processed or shaped especially in making crucial constructions whereas the superiorities are strong or qualified and have a unique artistic potention.

From its shape, stem waste of sugar palm tree has rounded shape but empty inside so it is only its stem bone rounded for about 2 – 3 cm that looks like pipe or big tube with 30 – 55 cm diameter. That kind of shape is a main characteristic of sugar palm tree. Thus, if we use stem of sugar palm tree as a based material of furniture, such characteristic should be kept. If the shape of that sugar palm tree is broken down into small pieces and then formed to be furniture products, the natural characteristic of that sugar palm tree will be disappear. As a consequence, the result of that furniture product won't be different with those furnitures from others based materials which have no unique values.

In order to maintain the natural chracteristics of sugar palm tree, so the concept which applied to the design or based pattern of furniture product that used stem waste of sugar palm tree is "tube" or cylinder concept, that is geometric design in three dimentionals form. In geometric term, tube or cylinder is shaped from two rows of circles which is connected by a rectangular rounded those circles. Visually, based shape of the tube is oval which can be formed by any size or volume. There are opened and closed tube shapes, in one side or both (in its base or cover). The shape of tube is resembled with the natural shape of sugar palm tree which cut in certain size, as seen in this figure:



Figure 1. Tube (left) stem waste of sugar palm tree (right)
(Source: Author, 2016)

The “tube” concept which is offered in this creation is pretended to be an appropriate concept in creating based shape of furniture product from sugar palm tree because if it’s implemented, it won’t omit the characteristics of sugar palm tree’s stem waste and will become a uniqueness from the result of furniture product. Next, the uniqueness can be one of the competitiveness between others furniture products. Besides that, with “tube” or cylinder concepts will give easiness in production because shape of sugar palm tree’s stem will be displayed naturally, so it won’t need a lot of construction. It is also a strategy to avoid making a lot of construction (extention), considering the weakness of stem waste of sugar palm tree if used to become furniture product is difficult to be processed or formed, especially in making complex construction because it’s hard and solid fiber characteristic.

The visualized “tube” concept as based design (furniture based shape) is predicted will produce simple shapes that fulfill a condition from technical and fungsional aspect. However, furniture is cultural product that’s not only considering with technical and fungsional aspects. But also considering with artistic and social value which visualizing his owner sense and social status. In order that the furniture able to fulfill fungsional value and art value or social value, in that simple based shape we need to apply decorated stye or ornament. Ornament will be an important part from the simple based shape to show product complexity value and become craftsmanship important feature needed, as a distinguishing from furniture products made by machine. Ornament motives can be also fulfilled by symbolic values that concerned with social life image and taste of its owner candidate or its buyer. Walker (1989: 60), when the products are bought and used, those products get its symbolic dimension or sign system, and starting to communicate meaning and values.

In making furniture products ornament motives from stem waste of sugar palm tree, there are some technicals should be concerned with its physic characteristics. First, stem of sugar palm tree is categorized as “hard” wood with solid fiber and undulation. This case will cause some problems if we apply the ornaments directly onto stem (based shape), because the motives will easy to be broken especially in crucial motives. Thus, its need to be considered in making separated motives, i.e. using wood board material and then patched onto based

material. Second, if the ornament made separately from its wood board, it will be constraint with the rounded stem of sugar palm tree, whereas the wood board has no elasticity characteristic that can be rounded easily following the rounded shape of sugar palm tree’s stem. In solving this problem, we can form the ornaments with *tatah* carved concept.

Tatah carved is a carved technic to form decorated style or ornament onto particular medium with omitting part of medium that not the part of the ornament motif so the only left are just continuity motives. The strength of *tatah* carved is laid on the interconnection among motives in one composition. The shape of *tatah* carved is resemble with perforate carved shape, whereas the perforate carved shape can be made in volume but *tatah* carved cannot be made in volume because *tatah* carved is made in slight medium, such as: paper, leather or metal. In Bali, *tatah* carved usually applied to form ornament in shadow puppets and in Ngaben ceremony equipment. In Java, *tatah* carved applied to form decorated style onto puppets or leather bag which combining with *sungging* technic (color gradation) so it’s called *tatah sungging*. With application of *tatah* carved technic, it can be formed onto any kinds ornament motives, including small and crucial ornament motives. The examples of *tatah* carved shapes and motifs onto paper and leather medium is shown in this figure:



Figure 2. Tatah carved using paper
(Source: Gungjayack, 2011)



Figure 3. Tatah carved using leather
(Source: Beo Bali, Juli 2016)

Although *tatah* carved technic generally applied on to paper, leather and metal, but it’s not impossible to be applied onto 1 cm slight wood board. From the testing result, the wood board with ≤ 1 cm thick with holes between 2 cm space and 1 cm hole in diameter,

it is found that in vertical direction, it can be curved into some degrees. It is show that wood board with 1 cm maximal thick, if we apply *tatah* carved technic with motif position vertically, it can be curved into some degrees. Thus, for furniture ornament from sugar palm tree's stem with cylinder based shape, it is possible to be made separately with using 1 cm thick wood board. Technically, the ornament which has been carved with *tatah* carved technic is pasted following furniture based shape curve.

The consequence from making separated ornament using wood material is lost of unity value, because sugar palm tree's stem has a characteristic which differ with wood board. Thus, it is need the application of color material to show the unity value between those different character mediums. For coloring, the stem of sugar palm tree as furniture based shape doesn't need any application color because it has its natural color and also its strong and solid physic characteristic that hard to absorb color material. Color material is only need to be applied onto ornament which made from wood board. Coloring technic that impossible to be applied onto wood board is gradation technic or black-shiny technic. With that technic, the colors will look in harmony even the composition of the colors is contrast or complementer colors.

From the analysis result above, it can be inferred that the concept of furniture design creation from sugar palm tree's stem waste is "tube" and *tatah* carved concept. "Tube" concept is function as a guide in making shapes of model design or furniture based pattern shape. *Tatah* carved concept is function as a guide in making ornament shapes or furniture decorated style. To approve that those concepts are deserve to be applied, its need to be tested or implemented in making any furniture products design model from stem waste of sugar palm tree, such as: table, chair dan wardrobe.

Implementation Concept Of "Tube" And "Tatah Carved" On The Furniture Design Of Sugar Palm Tree Stem

The existence or constancy a concept or a theory can be measured, among other, from its power prediction in explaining a phenomena or its implementation power in solving the problem. A concept will soon collapse if can't explains the phenomena that conceptualized or its implementation is incapable

of solving the problem in its praxis area. Therefore, it's required to test in order to prove the power of a concept. In this research context, the concept of "tube" and the concept of "inlaid carved" which offered for solving the problem of designing furniture products by considering the sugar palm tree stem as the main raw material, its implemented is tested through a series of experiment, namely: basic form design experiments (design), experiment ornament design, and illustrative design experiments.

Experiment design of basic sketch designs aims to make the basic forms of furniture in accordance with the concept of "tube, namely simple and not use a lot of complicated construction. The basic forms of furniture which made are tables, chairs, and wardrobe. The experiment process started with spontadpneous scratch using a pencil until it finds the rights form, which meets the rules of function and the rule of artistic. The basic shape lines which have been considered then thickened by using *drawing pen* and *routing* so that the shape looks more protrude. From some of sketch design the basic shape of each model which successfully created, then choose the best. The selection of the best sketch for each model (tables, chairs, and wardrobe) is carried out by involving designers, furniture practitioners, and furniture market players. The agreed criteria in determining the best sketch are: the accuracy of the function, size and proportion, the beauty of the shape, and the possibility to be produced.

The experiment of ornament design aims to make various ornamental shapes on the basic form of furniture with the application of the concept of inlaid carved. The implementation concept of inlaid carved can be made various object ornaments, such as plants, animals, artificial objects, natural icons, geometric shapes, including imaginative icons. Visualization of the objects into ornaments motifs can be carried out various techniques, such as stylization, distortion, and deformation, in accordance with characteristics of the object shapes that want to be described. Stylization is a technique of enrichment namely reducing or adding a form while still considering the ideal proportion; deformation is a representation or processing of the form in an analytic which is feature on certain parts of the original form that deformed to appear certain impression; distortion is representation of a shape which emphasizes of the achievement of the character by intensify (exaggerate) of certain parts of the drawn or shaped objects (Kartika, 2007: 71-72).

Experiment of illustration design technically aims to display the color shades on the sketch design of the basic shapes of furniture and ornamental design to appear together, although between the basic shapes and the ornament shapes are made with different mediums. The application of colors also aims to show volumetric impression on the sketch form as a guide in the process of design formation to the real furniture products. Artistically, the application of color aims to add the beauty of the shape so that it looks more interesting. For the purpose of the production, especially in the process of formation, the application of the color shades which displayed on the illustration designs useful in determining *finishing* style that will be applied when the design is realized into real products (ready to use). The application on the sketches of the basic shapes and ornaments shapes is carried out by the technique of dark-light coloring and color gradation namely the application of color gradually from the oldest color to the youngest color or on the contrary, from the light color (fine) to the older color (thick).

Experiment that carried out through several stages, namely experiment of the basic form (design), experiment of ornament design, and experiment of illustration design. From the experimental stages that carried out was successfully created three furniture product design models which have been considered the use of sugar palm tree stem as the main raw material. The three model of design are: 1) table design model; 2) chair design model; 3) wardrobe design model. As for the display form and analytical description of three furniture design are presented below:

1. Model of Table Design of the Sugar Palm Tree Stem Waste

The experiment design of the basic table sketch design produces several table models; one among them is a corner table sketch design. On the sketch design, the basic shape of table displayed with three shapes of tubes gradually, from the highest shape until the lowest in sequence. The first shape of the highest size (55cm) makes integrate, while the other two forms are made a half tube attached to other tubes. The appearance of a corner table is to illustrate there is the impression of the rhythm of the transition of the shape and size so that it looks more dynamic. The rhythm of the impression is strengthened by the appearance of the top of the table (table leaves),

namely the cover of the tube hole designed with wooden boards of different sizes that impress “hug” the other tubes. The bottom side also uses a thin wooden board with a variety of profile shapes to add the artistic value of the basic shape of the table. This sketch is designed as corner table on the edge of the living room. The whole shape and size detail of the sketch design, looks like the following picture:

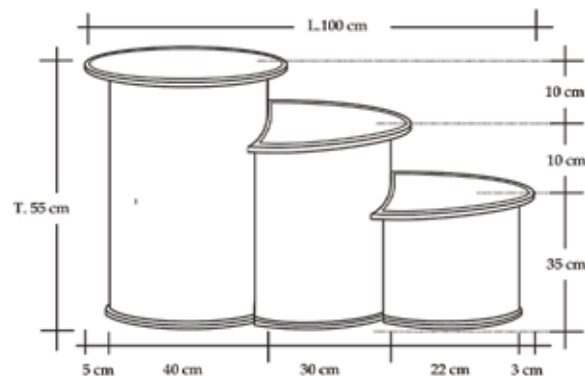


Figure 4. The basic shape of the corner table design
(Source: Author, 2016)

Ornamental design or decorative designs on the corner table are displayed on the part and on the top (table leaves). The ornament on the front of is created from the form of fish (animals that live in the water) as the main motif that displayed with stylization techniques. The fish motif seems more protrude than other motifs. For the supporting motifs described stylization of water ripples in wavy conditions. The manifestation of fish motion and wavy water gives the impression of dynamic rhythm. The shape of ornament overall represents the atmosphere of the habitat life in the sea.

The idea of describing the forms of fish with the atmosphere of life in the middle of the ocean, there is related with the physical condition of nature Gorontalo geographically surrounded by oceans and rich with various types of fish. The presence of fish forms as ornamental motifs is intended to indicate the existence of natural suggestion on the art. Another factor that inspires the emergence of the idea of creating fish forms into ornament motifs is to support the local government policy of Gorontalo which makes the fisheries and marine sectors as the main sectors activator the economic development. Therefore, stylization form of fish and sea waves that visualized is a representation of the natural condition and the local government policy. In this way, it's

expected the design that created will be appreciated more easily by the society.

Meanwhile, the ornament on the top of the table (table leaves) is designed with geometric motifs that composed central and radial rhythm. Geometric motifs on the top only as a complement of the motive of the front of the table, in order to achieve the unity between pieces of ornaments applied to the basic form of the table. The application concept of *inlaid carved* in all the ornament motifs seen from the holes separation between motifs which made interlocking hooks and not separate between the motives of one with other motives. Visualization of the ornaments on the basic shapes of the corner table looks like the figure:

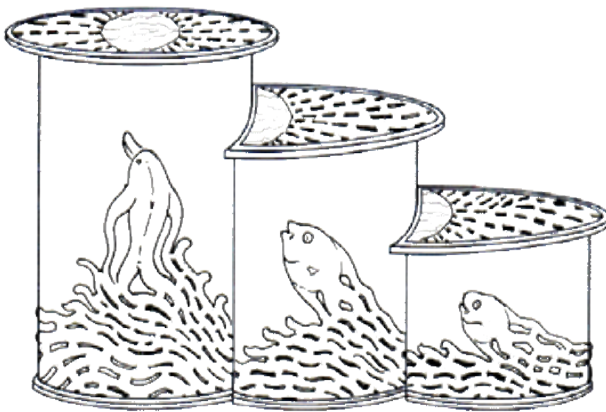


Figure 5. Ornament design on the corner of table.
(Source: Author, 2016)

To show the impression of volume and add tractive power is carried out coloring on the basic table design. The colored design is considered as illustration design. The coloring on the basic shape of the tables is made with brownish black color in accordance with natural color of the sugar palm tree stem. The color of the upper ornaments (table leaves) is made in green which applied with the gradation technique. Meanwhile, the ornament colors on the front (table body) in the form of ripples of sea water waves made in blue with dark-light technique to display the impression of the dynamics of sea water.

The main motif in the form of fish is made with light brown and orange with dark-light technique, similar to the natural color of sugar palm tree stem so that it looks united with the color of the basic shape of the table. The composition of the color overall looks bright and contrast but looks harmonious and

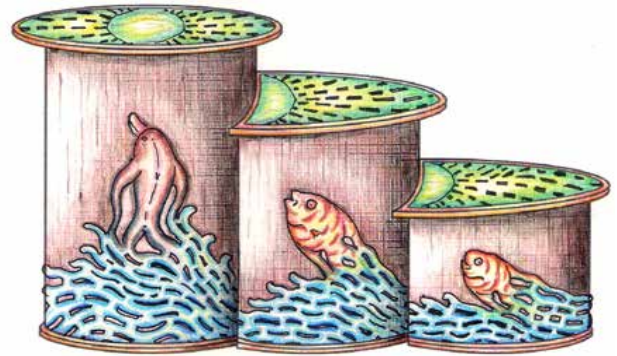


Figure 6. Corner table design model
(Source: Author, 2016)

dynamic. The application of color variations on the corner table design looks like the following figure.

2. Model of Chair Design of the Sugar Palm Tree Stem Waste

The experimental results of the sketch design form the basic shape of the chair was chosen one sketch that considered is the best. The design sketch of the chosen sketch is an implementation of the concept of tube which made with several variations. The shape of tube is perforated about 8 cm on the right and left side with different distances in order the shape stronger. Each hole covered with wooden board in the shape of a circle the size of the inside diameter of the body of the chair. This wooden board, in addition has the function as a place to put something, and as lasing shape of the overall seat. Therefore, the chair will be double function, namely as a seat and place to put something on the hole of the body part of the chair. On the top of the chair is designed using leather seat and chocking of the seat was made using profiled wood.

The ornamental design for the seats is made by processing geometric elements and plant elements. The ornament is diagonally composed on the left side upper and the lower right side of the basic shape of the chairs. The composition of such ornaments is made with consideration of the integrity and dynamics of the seats with the composition of the ornaments and the availability of decorated fields. The source of the idea of geometric motifs stylized into ornament shape on the upper left of the chair comes from the shape of wooden fence that used by traditional society as garden barrier or garden. The visual features of the fence is regular and constant, both in the making, material, and its appearance looks

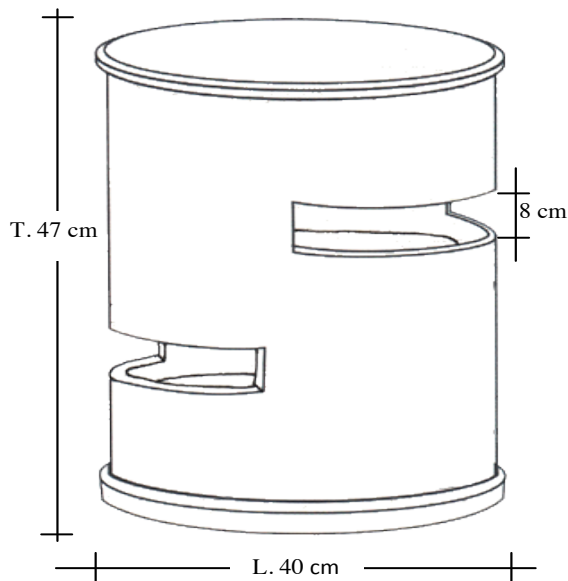


Figure 7. The basic shape of the chair design
(Source: Author, 2016)

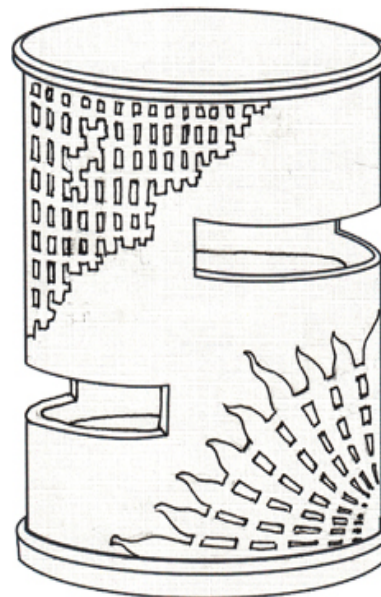


Figure 8. Ornament design on the chair
(Source: Author, 2016)

monotonous. In work of art, the *monotonous* shape makes a dull impression. To avoid that impression, then in the processing of the fence into an ornament motif made the impression such as a series of wooden fence blades are disconnected in order to look more dynamic. Meanwhile, the ornament on the bottom right side of the bottom of the chairs is stylized from the woka leaves, namely the type of plant like sugar palm that a lot of grow in Gorontalo as wild plant. Second the ornament is formed with the application of the concept of inlaid carved. This is evident from the intertwined interrelationships and forming the composition intact. In the embodiment process into a real product, the ornaments are made separately and then reassembled on the basic shape of the seat with a adhere technique. The sketch appearance of the ornament on the base shape of the chair looks like the following picture:

On the illustration design applied some kinds of color. For the body of the chair applied color pattern that approaches the natural color of sugar palm tree, namely dark brown, to create a natural impression. Natural color pattern were deliberately made a kind of color in the design of the table, because both models of furniture in the function will be used in pairs in a room. To give impression of the volume on the body of the chair is applied dark-light coloring technique, namely the left and right side are made with a dark color. The color is getting to the middle of the light as there is exposure to light. For decorative or ornament

color, either ornament on the top or ornament on the bottom is made with a green color applied with gradation color technique, so the color look more harmonious. Meanwhile, the upper color (chair seat) is used of the red color that is displayed with a dark-light technique. The appearance of this color aims to find unity with the body color of the chair. The color on the parts of the chair seat and parts on the bottom is orange that has a function as the color balance or liaison between the body colors of the chair with the color of ornament, so that all the colors are composed looks together. When viewed from the number of types that used, the design of the chair illustration includes simple and contrast, because the colors are applied with the dark-light technique and gradation technique, then the result of the coloring seem complicated, so the value of *craftsmanship* complexity more protrude. In this way, although the composition of the colors applied contrasts but still united and harmonious. The appearance of the illustrate design of chairs models looks like the following picture:

3. Model of Wardrobe Design of the Sugar Palm Tree Stem Waste

The experiment of making the base shape of wardrobe form the sugar palm tree stem was successfully made from a sketch of the unique basic shape with variations. On the sketch, the shape of tube was processed in such a way by cutting some part of the

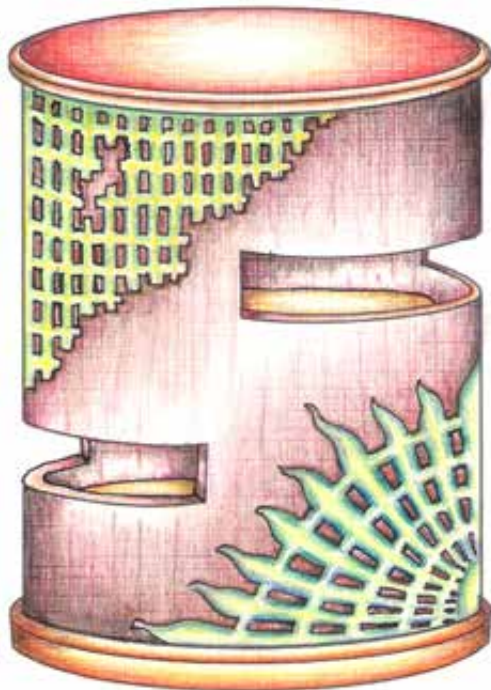


Figure 9. Chair design model
(Source: Author, 2016)

front and next to with variety styles. The variations are made for the practical and aesthetic purposes. Practically, the holes will have the functions to put something in the wardrobe, so that every holes is covered with the wooden boards the size of the inside diameter of the wardrobe. Meanwhile, aesthetically aims to appear the value of beauty in the shape before decorated with ornaments.

The variations at the top are made of the creation or processing of the basic crown of *Tilabatayila*, which is the crown of the traditional dress of Gorontalo for the Bridegroom, which is used in the ceremony of the marriage. The traditional *Tilabatayila* crown is also used often for the boys at the marriage ceremony. The traditional *Tilabatayila* crown is also used often for the boys circumcision ceremony. Therefore, the basic shape of the wardrobe has related with the local cultural of Gorontalo which have the opportunity to make it more unique compared to other cabinet forms. The high size of the wardrobe is made up to 180 cm with a diameter of 60 cm. with the size and shape the wardrobe will look grand and unique because a lot of variation. From the result of the evaluation is given note, that the design of this wardrobe sketch is probably hard to be produced in large quantities (massive), because the shape and natural size of the arena sugar palm tree of that size is not much predicted. However, the wardrobe model has the

change to be made in limited amount for the special customers. The visualization of the basic shape of the experimental wardrobe looks like the following picture:

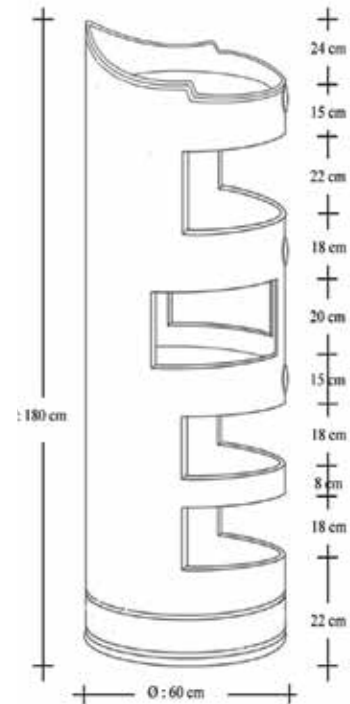


Figure 10. The basic shape of the wardrobe design
(Source: Author, 2016)

For ornament design on the wardrobe, the main motive is placed on the left and right side of the wardrobe that extends from the top to the bottom. The idea of the main motive is derived from the ornamental motif of the Gorontalo bride (*Bili'u*). especially the decoration on the skirt or *alumbu* (Gorontalo's language) which is in the form of a carved gold metal plate applied in a downward line on the front left and right of the bride's Gorontalo traditional dress (Botutihe and Daulima. 2003:214). The motif on the *alumbu* is processed to be simpler and then combined with one vertical lines and horizontal lines that lead to the circle. Although is carried out simplification, but does not remove the characteristic's menu on the *alumbu*. The appearance of decorative motifs that are created from the traditional fashion motifs of the Gorontalo bride is expected will add to the uniqueness of the wardrobe and looks more artistic. Meanwhile, the ornament that is in the front of the wardrobe is made to resemble the ornament motifs on the chair. The goal is the designs of the furniture which designed have unity and become one package of the furniture of the furniture products with three

types namely table, chair and wardrobe. Although the ornament design designed from different sources of ideas, but in its visualization looks unity and harmony. Composing between motives is made interconnected because its embodiment on the wooden board will be carried out with the application of *tatah* carved techniques.

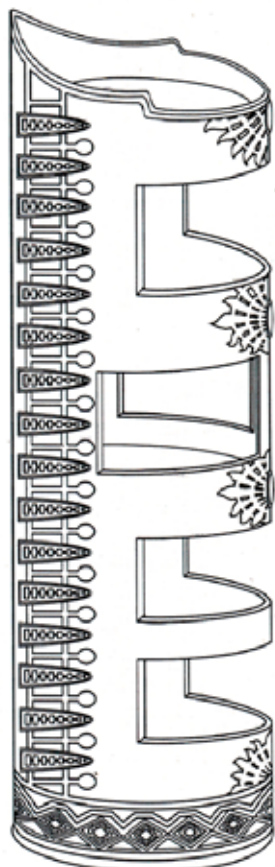


Figure 11. Ornament design on the wardrobe.
(Source: Author, 2016)

The experiment results of the cabinet's illustration design, the colors which applied seem more varied although the number of the color types that used are the same as the number of the color types on the design illustration of the table and the chair, because the shape and the size of the wardrobe design is bigger. The area of the field which filled with the ornament on the basic shape of the wardrobe design also bigger and more so that the application of the color becomes more freely. The color of the wardrobe cabinet is made same with the type of the color on the body of the tables and the chairs namely blackish brown, because all of the design are designed as one group of the carved furniture products in one room and seems so natural and antique. The ornament of natural fibers

of sugar palm tree stem is appeared with expressive black streaks.

For the ornament's color, the main motifs on the side which is the creation of the decorative of the traditional various fashion of the Gorontalo bride is made green, although the traditional ornament of the fashion become the source's idea of this design is made with gold or silver color in plaque or block. For the supporting motifs that are in between the main motifs are made with the orange color. The colors on the motifs are applied with gradation techniques started from the youngest color on the middle of the motif. The same type of the color is also applied on the geometrics' ornament under the wardrobe namely green and orange which applied with the gradation technique color. Meanwhile for the coloring of the ornament in the front of the wardrobe use only orange this applied with gradations' technique. Oranges' color is also applied to the inner chambers of the wardrobe, which is applied with dark-light techniques. With the types of color and application technique, the compositions of the color of the wardrobe design seem varied and harmony, as shown in the following figure:

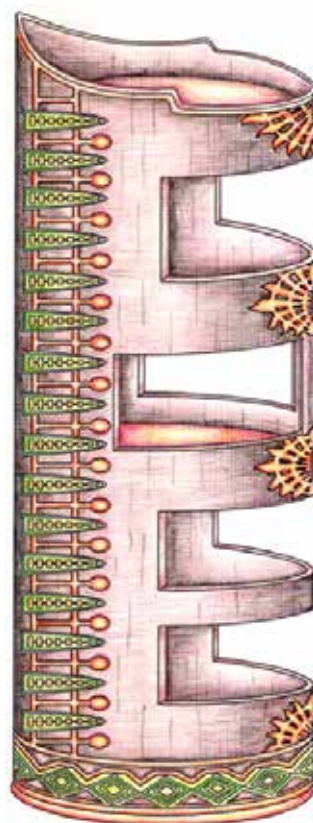


Figure 12. Wardrobe design model
(Source: Author, 2016)

Thus, it can be asserted that from the series of the experimental process which carried out whether the experiments of basic sketch design, experiments of ornament design, or experiments of illustration design are successfully designed several furniture products namely desk designs, chair designs and wardrobe designs. The form of design or the basic shape of the design model felt has represented the shape of tube or cylinder and its ornament and its ornaments shapes are displayed with carved chisel. Based on the results of evaluation which involving *furniture* product design, furniture practitioners, and furniture market player, all successfully design which made are stated worthy of production whether from the shape, color, function, production possibilities, or market prospect. This proves that the concept “tube” and carved chisel which offered on this research, is considered as an appropriate and feasible concept applied in designing models of innovative furniture products from sugar palm tree stem waste. Creativity of innovative design by utilizing unexpected natural resources into finished goods such as furniture and similar can save the use of raw materials and absorb a lot of labor (Indonesian Creative Industry Study Team, 2008:34)

CONCLUSION AND SUGGESTIONS

Based on the analysis of the characteristics of sugar palm tree stem waste through its physical properties, it's found the concept of “tube” and the concept of carved chisel as the concept that is considered feasible and appropriate to be applied in the manufacture of furniture products from the sugar palm tree stem waste (*Arenga Pinnata*). The concept “tube” has a function as guidance in making design or pattern basic of furniture and the concept of carved chisel have a function as the guidance in making ornament shapes or decorative furniture. Both of the concept can be used as reference or guidance in the creation of the models of furniture products of sugar palm tree stem waste with various functions and variations of form, in order to emerge models of new furniture products are unique and quality.

Implementation of the “tube” concept and the concept of carved chisel which carried out through a series of experiments, namely: the experiments of making basic sketch design, the experiments of ornament design, and the experiment of making illustration design, successfully made several models of furniture products namely: tables, chairs, and wardrobes.

From the results of evaluation that carried out to the shape, color, function, ease of production, and market prospect, all design which successes made stated eligible for the production.

Thus, this article has an argue, that to anticipate the lack of the type of quality wood as raw material of furniture products, it's can be used sugar palm tree stems waste as alternative raw materials. The use of sugar palm tree stem waste to produce unique furniture products can be done with the application of the concept “tube” for the manufacture of basic shapes or furniture design and the concept of carved chisel for the manufacturing ornaments or decorative furniture.

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