

## The Utilization Of Coconut Tree Stumps Into Chairs

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### ABSTRACT

The coconut trees were one of the commodity crops in South Aceh which were multifunctional trees because almost all parts of the coconut tree can be used. One part of the coconut tree that can be used was the coconut tree stump which can be processed into chairs. The aim of this research was to design chairs from coconut tree stumps, made chairs from coconut tree stumps and determine the ergonomic value of coconut tree stump chairs. The result of this research was the creation of a new innovative chair made from coconut tree stumps which has an overall height of 79 cm, chair back height 32.5 cm, chair back width 64 cm, seat depth 46 cm, armrest height 16 cm, and leg height 34 cm. Coconut tree stump chairs were made through several processes, namely the process of taking raw materials, the process of making chair patterns, the scraping process, the sanding and varnishing process. The coconut tree stump chair was a chair that was not ergonomic, because there were several parts of the coconut tree stump chair that did not comply with the concept of ergonomics.

### INTRODUCTION

South Aceh is a district in the province of Aceh. Located in a coastal area and facing the Indian Ocean. Most of the people made their living in the agricultural sector. Coconut trees were the plant cultivated by the people of South Aceh [1]. The coconut trees were the type of multifunctional plant because almost all parts of the coconut tree can be used. One of the products from coconut trees was a wardrobe and many others [2]. Lack of understanding about the advantages and value of coconut tree stumps meant that people did not pay special attention to coconut tree stumps. Seeing the loss of coconut tree stumps that were wasted and not used, the author thought of trying to be analyzed this problem by processing coconut tree stumps, thereby creating value in coconut tree stumps by making them into chairs. The coconut tree stumps that have no selling value will greatly affect the economic value when they become chairs. The Coconut tree stumps were larger than other tree stumps, so they were very easy to shape into chair products. Chairs have a function as a place to sit, designed to be as attractive as possible so that they will attract consumers' interest in buying them.

### LITERATURE REVIEW

#### Definition of Chair

A chair is a tool that is used as a place to sit, generally a chair has 4 legs which are used to support the weight for balance. Chairs are divided into several types, according to the type of material consisting of wood, plastic and stainless steel [3]. There are several things that need to be considered before making a chair to suit ergonomics. The following are ergonomic concepts that need to be equipped with a chair or seat, namely, the seat must be wide (40-50 cm), deep (37.5-45 cm), and high (40-45 cm), armrests must have height of the seat (17.5), Length from base to end (20 cm), Width (5 cm), and Slope from the front (5-7.5 cm), and the Backrest must be a height (30-40 cm) of stand [4].

#### Understanding Coconut Trees

Coconut (*Cocos nucifera* L.) belongs to the genus *cocos* and can grow easily in tropical areas. The coconut plants are often found in coastal areas because they require high humidity. Coconut trees are a type of palm. Coconut trees grow well because they are cultivated, this is what makes coconut trees easy to find, from flat coastal areas to high mountains [5].

#### Understanding Coconut Tree Stumps



A coconut tree stump is the base of a coconut tree that has been cut down. Coconut tree stumps are very different from other trees, if other tree stumps are the same size as the trunk and have large, branched roots, then this is different from coconut stumps which are round like buns covered in roots.

### **Characteristics of coconut trees**

The Palmae (palm) family does not branch and has bundles of leaves that have rings. The leaves are pinnate or fan-shaped with wide leaf midribs [6]. The height of coconut stems can reach 30 m with a diameter of 20-30 cm, depending on climate, soil and soil environment. In order to be used as a building material, coconut stems must be taken from plants that are old enough [7].

### **Types of Coconut Trees**

The following are types of coconut trees that are spread in various regions, namely:

1. Kopyor coconut,
2. palm oil,
3. early maturing coconut,
4. Ivory coconut,
5. red coconut
6. yellow coconut

### **Advantages of Coconut Tree Wood**

The following are the advantages of coconut tree wood which is suitable as raw material for crafts:

1. The price is more affordable compared to first class wood such as teak, bengkirai and ironwood
2. The size is stable and does not bend easily
3. Resistant to pest and weed attacks
4. The rough coconut wood fibers produce unique motifs
5. Not easily dented, scratched or damaged by sharp objects

### **Weaknesses of Coconut Tree Wood**

According to Mosteiro and his friends, naturally the soft parts of coconut tree wood that are not preserved will be eaten by termites and rot. Coconut wood has low resistance to water. Coconut wood fibers can injure hands. The moist condition of coconut wood makes the surface easily springy, the processing process is considered very difficult because it requires the right technique to process it [8].

### **Benefits of Coconut Trees**

Coconut is a type of multipurpose plant and has high economic value. All parts of the coconut tree can provide benefits to humans, from the roots, stems, leaves, flowers to fruit.

## **METHOD**

The research method used was experimental, where the researchers manipulated one or more independent variables, controlled variables outside the independent variable, and made observations on one or more variables along with manipulating these variables.

### **Tools and Materials**

The tools and materials used in this research were as follows:

1. The saw is used to cut coconut tree stumps
2. The hand grinder functions to smooth rough areas on coconut tree stump chairs
3. The ax is used to cut the parts you want to throw away
4. The chisel functions to carve the part you want to shape according to the pattern
5. The meter functions to measure
6. Sandpaper functions to sand or smooth rough areas
7. Markers are used to make patterns
8. The file is used to grind down the jagged parts of the coconut tree stump chair
9. Chaisaw is used to cut coconut tree stumps.

The materials used in these research are as follows:

1. Coconut tree stumps are the main ingredient
2. Clear and impra are a type of liquid that functions to give a shiny impression

3. Thinner is a liquid substance that functions to dilute finishing materials
4. Wood glue, in this research, functions as a mixture for patching wood
5. Wood powder, functions as a mixture used in patching wood.

**Flow Chart**

The following is a flow diagram of research into making chairs from coconut tree stumps:

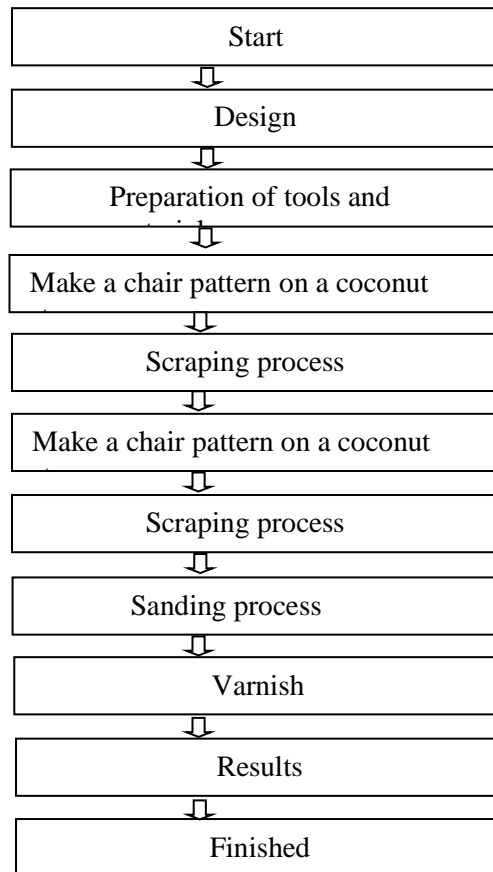
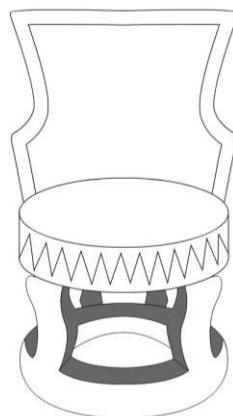


Figure 1. Flow Chart

**RESULT END DISCUSSION**

**Chair Design from Coconut Tree Stumps**

The chair is made from coconut tree stumps and the application used to design the product was Autocad 2010. The design of the chair can be seen in Figure 2. The stump used was a coconut tree stump that was ± 25 years old which has a large size so that in the process it was easy to make according to with product design. The following is a chair



design from coconut tree stumps.

Figure2. Chair Design

**Process of Making Chairs from Coconut Tree Stumps**

The process of making a chair from a coconut tree stump consists of taking the coconut tree stump, making a chair pattern on the coconut tree stump, scraping, sanding and varnishing. The following is a clearer explanation of each process for making a coconut tree stump chair.

**a) Coconut Tree Stump Removal**

Coconut tree stumps are measured first to match the dimensions that have been designed. Then it is taken by cutting the very bottom or base of the coconut tree stump using a chainsaw.

**b) Process of Making Chair Patterns from Coconut Tree Stumps**

The pattern is made to a predetermined size using a marker. This aims to simplify the scraping process.

**c) Scraping Process**

The scraping process aims to give the basic shape of the coconut tree stump chair, there are 3 scraping stages, namely:

1. Stage 1 of scraping, is scraping using a chainsaw, the activity carried out is making a checkerboard pattern the width of the chainsaw blade on the back of the chair. The legs are cut to leave 4 pillars.
2. Stage 2 scraping, is scraping using an axe, the activity carried out is removing the checkered pattern made in stage 1. The process at this stage produces a concave chair back pattern.
3. Scraping stage 3, is scraping using a chisel, the activity carried out is tidying up the scraping process in stage 2 and removing the bark from the coconut tree stump.

**d) Sanding Process**

Next is to grind the rough and jagged parts using a file, then rub or sand the chair using a hand grinder, sand all parts of the chair, if there are parts that are difficult to reach using a machine then rub them by hand using sand paper

**e) Varnish**

The final stage in the process of making a coconut tree stump chair is to make the chair look shiny, namely by lubricating all parts of the chair with 4 layers of varnish. Apart from giving a beautiful impression, the varnish also functions to make the chair more durable and resistant to mold and termites.

**Product Results**

From several processes carried out in making coconut tree stump chairs, the resulting product was shown in Figure 3. The overall height of the chair was 79 cm, with a chair back height of 30 cm, a chair back width of 64 cm, a hand height of 16 cm, and a chair leg height of 32,5 cm. The coconut tree stump chair was made into one seamless unit with the legs made into hollow circles so that the chair looked more unique. The coconut tree stump chair has the typical color of a coconut tree stump. The entire chair was shiny and coated with varnish.



Figure 3. Product Results

### Ergonomic Value of Coconut Tree Stump Chairs

The coconut tree stump chair was intended to emphasize aesthetic value, but overall it was not a chair that was used for work purposes. Considering the importance of ergonomics in chairs, this requires an ergonomics concept in coconut tree stump chairs. The following was the suitability of the coconut tree stump chair with the ergonomics concept:

1. The ergonomic concept of the stand was, (Width 40 cm, depth 37.5-45 cm, Height 40-45 cm). On a coconut tree stump chair, Width 47 cm (according to the ergonomic concept), depth 46 cm (not according to the ergonomic concept), Height 32.5 (not according to the ergonomic concept).
2. Armrest the ergonomic concept was, (Height of the seat 17.5-22.5 cm, length from base to tip 20 cm, average width 5 cm, slope from the front 5-7.5 cm). In coconut tree stump chairs, the height of the seat was 16 cm (not according to the ergonomic concept), the average width of the armrest was 4 cm (not according to the ergonomic concept).
3. Backrest the ergonomic concept was, (Height 30-40 cm). On a coconut tree stump chair, the backrest height is 30 cm (according to the ergonomics concept).

Based on observations of the compatibility of the ergonomic concept with the coconut tree stump chair, it can be concluded that the coconut tree stump chair is not an ergonomic chair, because there are several parts that do not comply with the ergonomic concept.

### CONCLUSION

From the research that has been carried out, the following conclusions can be drawn:

1. The coconut tree stump chair consists of a backrest, seat, armrests and chair legs. The specifications for the size of the coconut tree stump chair were the overall height of the chair 79 cm, the height of the chair back 32.5 cm, the width of the chair back 64 cm, the height of the armrests 16 cm, and the height of the chair legs 34 cm. Some components of coconut tree stump chairs did not have ergonomic value.
2. Coconut tree stump chairs were made through several stages of the production process, namely taking raw materials, making chair patterns on coconut tree stumps, scraping, sanding and varnishing. The coconut tree stump chair has the typical color of a shiny coconut tree stump coated in varnish.
3. A coconut tree stump chair was a chair that was made into a single unit without connections. The width of the ergonomic chair seat is 40-50 cm, the coconut tree stump chair seat was 47 cm wide, so only people with a maximum hip size of 46 cm can sit on the coconut tree stump chair.

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