

Environmentally Friendly Material Characteristics Applied to Interior and Furniture

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Abstrak Nowadays many new materials have been found and will predictably be replacing the old material such as wood, bamboo and others soon. However, the question whether the new material safe and friendly for the environment are still being questioned? Each material has different strengths, weaknesses, special characteristics and textures. Their natural physics can be adjusted and treated according to function before they can be applied to design, especially for interior design, furniture and interior accessories. Choosing the right material for design should be done in several selections and processes. One of the important selection is sustainability and green design aspect on the material. This is going to be the most important aspect to be considered in designing in the future. The aims of this research are selecting several natural materials that represent green materials and materials that can be recycled. The methods of this research were collecting data from primary and secondary resources, and then analyzing the data and separated them based on each criteria of green material and recycle material. It will give more information on the data so that the result can be used as catalog for materials that is easily accessible for a designer and the society.

Keyword : natural material, green material, recycle material, design

INTRODUCTION

The materials used in the design has been through quite a long history. Starting from 3000 years BC to the present time, one of the evidence can be seen in the temple buildings in Egypt that use rock material in buildings and interiors. A wide variety of materials have been used by people in their everyday lives, from the start material, rocks, wood and other metals. Material usage has become the most important part of human life. Various alternative materials found had a significant impact on the environment and nature. Designers who are part of the design industry are contributing to the current global warming issue. It takes the wisdom of designers to react about what happen in this world today. One of the concern and responsibility that can be done by designers, by wisely make the selection of the materials in the interior design and furniture, using materials that can be recycled and environmentally friendly. As Papanek, (2016) writes in his book "*Design for the Real World*", designers are not only responsible for the designs they create, but also must be environmentally and socially responsible around them. According Baldawi statment, (2015), the designer can attempt to minimize the use of finishing materials, to save portions of the existing interior installation, and simply reuse materials, including furniture and furnishings, when modifying an existing interior space.

Studies on such environmentally friendly material derived from nature such as wood, bamboo, rattan, fiber and clay are materials that are recyclable and environmentally friendly. This material has been mostly used by Indonesian people for generations and become a part of their daily life. The comings of synthetic materials on the market has several advantages in terms

of diversity of types and colors, ease of production, and competitive pricing. This has led many designers to use the synthetic material in their designs, although many of these materials are not environmentally friendly materials. One reason is the lack of familiarity of environmentally friendly materials that exist around (local) so that the use of such material is less desirable.

METHODOLOGY

This research methods based on an observation in Indonesia and study literatures, the type of materials that exists in nature and environmentally friendly which still very limited in terms of both the diversity of characteristic and diversity of textures and colors. Most of these materials have the largest category as material derived from recycled have a fairly high production costs. From an observation, some natural materials have characteristics of environmentally friendly materials, that can be applied to the interior design and furniture.

RESULTS AND ANALYSIS

Green concept (Green) has a lot of understanding, but based on the explanation of Green Council Building Indonesia (GBCI), the concept refers to the principle of sustainable or known as sustainability. In Indonesia the application of green concept or environmentally friendly to the material is still not much finished, although there are already some industries that started a few years ago by completing the green label on the product, but still is marginal. While in the international world, the green concept is already common, because their level of awareness of the environment and quality of life is quite high (GBCI: 2010). The implementation

of this green concept provides a very positive impact not only environmental, but also social and economic, among them:

- A. Material efficiency / raw material, the use of materials is more efficient because the costs incurred in optimizing for the quality of material (best quality).
- B. Physical and spiritual health. Green material does not use or contain hazardous materials (toxic, VOC, etc.) so it is safe for users and the environment.
- C. Optimum design. The design is optimally made possible because of the efficiency in the use of raw materials.
- D. Cost-effective (production, transportation, etc.). The green material comes from the surrounding environment (local) so the transportation cost is smaller and the production process is minimized.
- E. Broader target market. Increasing public awareness of the environment will increase demand for environmentally friendly materials.
- F. Environmental awareness is on the rise. The community's tendency towards environmentally friendly materials shows that public awareness of the environment is also increasing.

By applying green concept to the material used, it is expected that designers can participate in things such as pollution prevention, energy saving (production), recycling (material), using materials of sustainable practices. Designs such as interior design and furniture can be categorized as a design that applies green concept if it can meet the criteria of green material as the following: renewable, recycled, durability, adaptable, low energy and raw materials around (made with low embodied energy & local sourced), sustainable in installation, unloading and maintenance (sustainably installed, removed & maintained), nontoxic. According to Brown and Farrelly (2012) in addition to material aspects, which should be a material consideration in choosing materials in the design, especially interior and furniture are: acoustic properties, strength / load power (tension), hygiene, light transmitting, water resistance, safety, thermal process, fire resistance.

As stated by Bonda and Sosnowchik (2007), every designer knows that a good data source is important for a good design. To be a designer who is aware of the environment must have special knowledge and accurate data easily. Every chosen materials to delivered a good interior design and furniture designs, must be considered the characteristics. For examples, the choosing of synthetic materials coming from non-renewable resources that prefer in dimensional instability than wood, even that is easy to work with and offers advantages such as high strength-to-weight ratio and lower processing energy. Designer and clients have to work together in promoting materials that are sustainable, acquired from the available databases and sources that can be found by the specialists rather than

going to trade retailers, where it surely will spend more time and energy. Hayles, (2015)

A. Material Selection

The selection of materials in a design has many considerations so that a clear criterion or standard that can be used as a guide in choosing is required. Selection of a material is the first and most important decision in the design process. Based on the thought that the selection of materials in the design, especially on interior design and furniture should be more attention. Here the role of designer is very vital because the designer acts as an educator and motivator whom can provide direction on the importance of the use of environmentally friendly materials and recycling on the design. Design considerations in choosing materials include: form (physical), texture (surface), characteristics, characteristics (mechanical), cost, user, and the impact on health and the environment. According Binggeli, (2014) The material also has several criteria in its application, among others: color: depends on quality and light, durability: strength to compressive power, elastic: has flexibility so easily formed, shape: has 3d shape that is length, width and height, strength: load-bearing ability, texture: has a rough surface or soft, plasticity: can be changed shape, and refinement: can be changed from its original form.

B. Material Friendly Environment

Environmentally friendly materials have many criteria, among which can be grouped into research are:

- The process of obtaining the material (raw material) does not damage nature and the environment.
- The material does not use toxic materials in production.
- Material has a high durability.
- Waste from the processing material can be reused.
- Material obtained from sources that are located close to the user (local resources).
- Biodegradable material.

Types of materials that fall into the category of environmentally friendly materials includes wood, rattan, bamboo, and natural fiber. The types of materials that fall into the category of environmentally friendly materials include: types of wood, types of rattan, bamboo species, types of natural fiber and clays.

C. Material Recycle

The definition of recycled materials from various sources is a material process into materials or new objects in order to reduce waste / waste and utilize the advantages of the material itself. It also reduces the consumption of original materials (raw material). Which fall into the category of recycled raw materials based on Liferi. C (2014), are as follows:

1. Recyclable : materials that can be reprocessed at the end of use.
2. Recycle content : using post-consumer waste instead of virgin resources.

3. Compostable : Materials that will decompose and provide nutrient to the soil.
4. Bio-Based : Materials that are grown and are therefore a renewable source.
5. Non-toxic : Materials containing minimal or no harmful chemical. The types of materials that can be recycled include:
 1. Metal: such as aluminum, iron is a material of nature that undergoes the formation process so that it can be used and can be recycled with similar compositions.
 2. Glass: waste or broken glass can be made into new material by composite or printed with resin.
 3. Ceramics: residual or ceramic fragments can be made into new material by composite or printed with resin.
 4. Paper: the rest of the paper can be destroyed and made new paper (recycle paper) with different textures.
 5. Textiles: residuals or pieces of fabrics can be material or new products with the development of creativity.
 6. Plastics: plastics with certain basic ingredients or derived from biodegradable can be melted into new plastics

CONCLUSION

Design development in the future should also be able to consider several aspects of society, environment and economy. A designer must understand how to integrate everything to create a sustainable design (ecofriendly concept and recycling). Various types of materials that exist both derived from nature and made by humans is an endless source for the exploration. The current use of materials in interior design, furniture and interior accessories is still very limited, so the opportunity to create with all types of material is still

very wide and possible. This research is only a small part of all the material, and still requires a lot of data analysis to do the grouping and other categories. What is done in this research is a small part of the material utilization process in sustainable environment.

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