ARCHITECTS' ATTITUDE AND PREFERENCES TOWARDS TIMBER AS A BUILDING / CONSTRUCTION MATERIAL

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ARCHITECTS' ATTITUDE AND PREFERENCES TOWARDS TIMBER AS A BUILDING / CONSTRUCTION MATERIAL

By

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DEDICATION

I dedicate this thesis for my parents,

Who are dearest to me and the reason for me being what I am today.

They have always love me unconditionally and they believe in me when nobody else did.

ABSTRACT

Timber is a versatile, durable and wonderful material which found its usage in various aspects of people's life for thousands of years. Its versatility means that it has a broad range of uses in society, especially as a material for the construction of buildings. Building and construction project involves multiple levels of thoroughly planned decisions and among it includes the materials to be used in the project. There are several key players that decide on many decisions for the project, including what materials to be used. Among them, the architect usually is one of the main key players that decide if timber is to be used as materials in the project. The aim of this project is to understand architect's preference and attitude in choosing timber as building and construction materials. A web-based survey using a structured questionnaire was used to collect data from architects listed from Board of Architects in Malaysia and Malaysian Institute of Architects. From the survey, most of the architects gave a positive response on selecting timber and timber product as a construction material. However, there are some factors and reason that hinders architects from specifying timber and timber product. This in return may help the timber industries in Malaysia to understand the weaker aspects of timber that need to be strengthen and polish the potential aspects of timber, so that timber will rise up again to become a competitive buildings and construction materials.

ABSTRAK

Kayu merupakan bahan mentah berguna yang kukuh dan serba boleh, dan digunakan di dalam pelbagai aspek di dalam kehidupan manusia sejak berabad lamanya. Ciri serba boleh bermaksud kayu mempunyai pelbagai jenis kegunaan di dalam kehidupan masyarakat, terutamanya sebagai bahan di dalam pembinaan bangunan. Bangunan dan projek pembinaan melibatkan beberapa tahap keputusan yang dirancang secara rapi, dan antara keputusan tersebut termasuklah berkenaan bahan yang digunakan di dalam projek. Terdapat beberapa pihak utama yang membuat keputusan di dalam banyak perkara dalam projek, termasuk bahan yang akan digunakan. Antara pihak tersebut ialah arkitek, yang biasanya merupakan salah satu individu penting yang menentukan samada kayu akan digunakan sebagai bahan di dalam projek. Matlamat utama projek ini ialah untuk memahami dan mengenalpasti pilihan dan sikap arkitek dalam memilih kayu sebagai bahan di dalam pembinaan dan bangunan. Borang kaji selidik online digunakan untuk mengumpul data dari arkitek yang berdaftar dengan Lembaga Arkitek Malaysia (LAM) dan Pertubuhan Arkitek Malaysia (PAM). Dari kaji selidik yang dijalankan, kebanyakan arkitek memberikan jawapan positif dalam memilih balak dan produk balak sebagai bahan pembinaan. Melalui kajian ini diharapkan dapat membantu industri perkayuan di Malaysia untuk memahami aspek lemah balak yang perlu dikuatkan dan menggilap potensi kayu balak, supaya balak kembali menjadi bahan pembinaan bangunan berdaya saing.

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APPROVAL SHEET

I certify that this research project report entitled "**Architects' Attitude and Preferences Towards Timber as a Building/construction Material**" by Jaen Zhoweyna Jibid has been examined and approved as a partial fulfillment of the requirements for the degree of Bachelor of Wood Science and Technology in the Faculty of Forestry, Universiti Putra Malaysia.

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LIST OF ABBREVIATION

LVL Laminated Veneer Lumber

CLT Cross-laminated Timber

CHAPTER 1

INTRODUCTION

1.1 Background

Wood has been used as a building material for thousands of years, being second only to stone in terms of its rich and storied history in the world of construction. The chemical properties of wood are inherently complex, however, human beings have successfully harnessed the unique characteristics of wood to build a seemingly unlimited variety of structures. This exceptionally versatile material is commonly used to build houses, shelters and also boats, and it is also extensively used in the furniture and construction industry as well.

Perhaps one of the biggest advantages of using wood as a building material is that it is a natural resource, it is readily available and economically feasible. It is remarkably strong in relation to its weight, and it provides good insulation from the cold. Wood is highly machineable, and can be fabricated into all kinds of shapes and sizes to fit practically any construction need. Wood is also the perfect example of an environmentally sustainable product; it is biodegradable and renewable, and carries the lowest carbon footprint of any comparable building material. In addition, no high-energy fossil fuels are required to produce wood, unlike other common building materials such as brick, steel or plastic.

However, the use of timber products in the construction industry is reported to be almost negligible (Wong, 2008). The industry is increasingly using other alternative materials such as steel and concrete (Abu Hassan et al., 2011; Fujita et al., 2009; Nor Haniza et al., 2007)

1.2 Problem statement

In Malaysia, the timber industry caters not only the international export but also the domestic market for timber products. Even though being an important market outlet for timber products, most domestic markets including Malaysia's, generally receive less attention because it is almost always overshadowed by exports (Bourke, 1991). For example, the domestic consumption of primary timber products and furniture in Malaysia was worth about RM7.6 billion in 2008, while export of timber and timber products was about RM22.5 billion (MPIC, 2009). However, the scenario in Malaysia is expected to change with the launch of the National Timber Industry Policy 2009 - 2020 (NATIP) which recognizes the importance of the domestic timber market. A major consumer of timber and timber product produce in Malaysia is the construction and housing industry.

When using or specifying the material, various professionals in the construction industry such as the architects, may have different perceptions towards the timber material. Such perceptions may influence the decision to use timber material in a building. In general, though, when starting a building project, architects and structural engineers are consulted early on in the

process to produce technical descriptions and perform calculations for the construction of the building.

While in Malaysia, the customary practice is for the clients to offer a project to building contractors where the contractors will each compete to deliver the most optimum tender and the decision rests with the client to select a qualified contractor. When the tender of a contractor is received by the client, it has triggered the so-called bond contract between the contractors that had been selected by the client. Then the architect act as a consultant and will prepare sketches to describe the alternative solutions whether it is suitable or not with the requirements of the client. Architects will also check the local planning regulations so that existing projects do not break the rules. Whether directly involved in the material selection or not, architects do influence the choice of material. Their perceptions of, attitudes towards, and interest in different materials will influence what they propose.

Ultimately, the decision to use timber especially in building construction depends on the attitudes and preferences of the person that is responsible for the construction project, such as the architects. Thus, it is important to understand the architect's roles, attitudes and preferences with regard to use of timber and timber products as a building material.

1.3 Objective

i). To determine preferences and attitudes of architects towards timber material usage in building construction.

REFERENCES

Abu Hassan, A.B., Mahyuddin, R., Mazlina, J. & Aulina, A. (2011). Awareness Assessment Framework for Implementing the Sustainable Housing in Malaysia. *Asian Journal of Management Research*, *1*, pp. 703-713.

Ajzen & Fishbein. (1980). *Understanding Attitudes and Predicting Social Behaviour*. Englewood Cliffs, NJ: Prentice-Hall

Bayne, K. & Taylor, S. (2006). Attitudes to the use of Wood as a Structural Material in Non-residential Building Applications: *Opportunities for Growth. Australian Government: Journal Forest and Wood Products Research and Development Corporation*. pp 42.

Bourke, I.J. (1991). *Domestic Timber Markets: Important Outlets for the Developing countries*. Retrieved from http://www.fao.org/DOCREP/U4200E/u4200e05.htm

Bysheim. K. & Nyrud. A. Q., (2008). *Architects' Perception on Structural Timber in Urban Construction.* Retrieved November 2017 from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.564.39&rep=rep1&type=pdf

Bysheim. K., & Nyrud. A. Q., (2009). Using a Predictive Model to Analyze Architects' Intentions of Using Wood in Urban Construction. *Forest Products Journal, 5,* pp. 65–74.

Cruz, P. J. (2016). *Structures and Architecture: Beyond their limits*. Andover: Routledge Ltd.

Dillman, D. A., Smyth, J.D., & Christian L.M. (2014). *Internet, Phone, Mail, and Mixed-Mode Surveys: The Tailored Design Method*. Somerset: John Wiley & Sons.

Department of Statistics Malaysia. (2010). Retrieved from http://iiesm.uitm.edu.my/v2/images/stories/PRESENTATION%20SLIDE/curent%20status%20of%20ibs%20industry%20in%20malaysia.pdf on 5 September 2017.

Denizou, K., Hveem, S., & Time, B. (2007). *Three in town - Which Mechanisms Control the Choice of Materials for Larger Urban Structures*. Oslo: SINTEF Byggforsk.

Finkel, G. (1997). *Economics of the Construction Industry*. London: Routledge Ltd.

Ferguson, I., La Fontaine, B., Vinden, P., Bren, L., Hateley, R. & Hermesec, B. (1996). *Environmental Properties of Timber, Research Paper commissioned by the FWPRDC*.

Knaack, U. (2007). *Façades: principles of construction.* Basel: Birkhäuser.

Kozak, R. A. & Cohen, D. H. (1999). Architects and Structural Engineers: An Examination of Wood Design and Use in Nonresidential Construction. *Forest Products Journal*, *49*(4), pp. 37.

Kozak, R. & Cohen, D. (1997). How Specifiers Learn about Structural Materials*. Journal Wood and Fibre Science. 29(4). pp. 382-383*

McLeod, S. (2009) *Attitudes and Behaviour*. Retrieved on November 2009 from https://www.simplypsychology.org/attitudes.html.

MPIC. (2009). *National Timber Industry Plan, 2009-2020*. Ministry of Plantation Industries and Commodities, Malaysia.

Nor Haniza, I., Zuraini, M.A., Yacob, O. & Helena, A.H. (2007). Case Studies on Timber Defects of Selected Traditional Houses in Malacca. *Journal of Design and the Built Environment. 3*, pp. 81-90.

Hoadley. R. B, (2000). *Understanding Wood: A Craftsman's Guide to Wood Technology*. Newtown, CT: Taunton Press.Inc.

U.S.. Department of Agriculture. (2007). *The Encyclopedia of Wood*. New York: Skyhorse Pub.

William, Y. (2017). *What is Perception in Psychology? – Definition & Theory*. Retrieved November 2017 from https://study.com/academy/lesson/what-is-perception-in-psychology-definition-theory-quiz.html

Wong, T.M. (2008). Ensuring Quality Assurance in Timber Applications. *Master Builder Journal 1st Quarter.* pp. 84-87.

Wagner, E. R. & Hansen, E. N. (2004). A method for identifying and assessing key customer group needs. *Journal Industrial Marketing Management*. 33(7). pp. 643-655.