Available Online at www.e-iph.co.uk
Indexed in Clarivate Analytics WoS, and ScienceOPEN

E-B Environment - Behaviour Proceedings Journal

International Virtual Colloquium on Multi-disciplinary Research Impact (2nd Series)
Organised by Research Nexus UiTM (ReNeU)
Office of Deputy Vice Chancellor (Research and Innovation)
Universiti Teknologi MARA 40450 Shah Alam, Malaysia, 15 June 2022

e-IPH e-International Publishing House Ltd., United Kingdom

Potential of Waste Natural Fiber Composite for Printmaking Matrix in Artistic Practice

Khairul Zikri Abdullah [1], Mohd Fuad Md Arif [2], Wan Samiati Wan Mohamad Daud [3], Mansur Ahmad [4]

[1,2,3] College of Creative Arts, Universiti Teknologi MARA, 40450 Shah Alam, Selangor, Malaysia
[4] Faculty of Applied Science, Universiti Teknologi MARA, 40450 Shah Alam, Malaysia

zikri@uitm.edu.my, fuad5649@uitm.edu.my, samiati@uitm.edu.my. mansur628@uitm.edu.my
Tel: +60125529953

Abstract
Natural fiber waste is an issue where the whole globe always talks about this waste to be utilized. Printmaking is one fine art discipline in which the work will transfer images from one matrix's surface to another's surface. Various techniques and methods in producing this printmaking work and artists always do various experiments and explorations that each look to significant output printmaking itself. This paper aims to explore the potential of natural fiber wastage as a substance to develop a matrix for printmaking in artistic practice. This research will be conducted in a semi-scientific laboratory and studio.

Keywords: Printmaking, Fine Art, Natural Fiber Waste, Printmaking Matrix

DOI: https://doi.org/10.21834/ebpj.v7iSI7.3772

1.0 Introduction

Natural fiber waste is an issue where the whole globe always talks about this waste to be utilized. Applications of natural fiber composites (N.F.C.) can be traced back to the ancient Egyptians, who made bricks out of clay, mud and straw. More recently, natural fibers as a reinforcement in polymer composites have been gaining much attention, especially in the research community. (R.D.S.G. Campilho, U.S.A. 2019).

As is commonly known, most countries that own the timber and plantation industry will certainly produce fiber waste which needs to be managed systematically and practically. Natural fiber, also known as Agricultural Fiber, significantly impacts various sectors. These natural fiber wastes are of notable economic and cultural significance worldwide and are used for building materials, decorative products, and versatile raw products (Rudi Dungani,2018). Agriculture waste can be obtained from plants such as oil palm, bagasse, corn stalks, coir, bamboo, pineapple, banana, and rice husk, extracted on the plant's part (stem, leaf, seed, fruit, stalk and grass/reed). As stated in science and technology, scientists always produce products that innovate in various fields above, not to mention artists who always creatively think of natural fiber waste in workers' income.

Similarly, in media and medium income in the context of printmaking that always requires something new and natural fiber waste is possible in artistic practice. There is no research regarding natural fiber waste in artistic practice in making paper and surfaces for printmaking, but no one has used natural waste composite. So exploratory in producing printmaking matrix is very limited and needs to be significant in the income of this matrix.

DOI: https://doi.org/10.21834/ebpj.v7iSI7%20(Special%20Issue).3799

2.0 Literature Review

Printmaking is the art of man and technology while the making process of print work. It means the conflict between man and machine; the hand made and replicated the original and the copy (Richard S. Field). Prints are highly individualized statements within the confines of rigidly defined technical. Printmaking is commonly thought of as a "traditional" art form, and it is true that the use of old methods is still valued. There has never been a problem with printmakers embracing the latest commercial breakthroughs and changing their old approaches to reflect newer technology advancements. In The Contemporary Printmaking in The Northwest glossary, a print is an image that has been transferred from one surface to another surface. *Art terminology* is usually defined as an image designed and fixed (by cutting, incising, or chemical) on a matrix, which may be a block of wood, a stone, a metal plate, or other material. The matrix also enables the production of repetition of the image. The technique is printed by press machine or manually rubbing (burnishing) using a barren or wooden spoon. Printmaking is the production of images generally on paper. The making and printing of the artworks by hand or machine under the artist's supervision are considered the original print.

2.1 Printmaking Techniques

Relief printing is the surface of a block that yields the image. It means a drawing of an image directly onto a suitable surface such as wood or linoleum. The artist then cuts or carves all the space around it, raising the drawn areas. After this process, ink is rolled onto the block and the image is transferred onto the paper through a press machine or pressed by hand. The primary relief techniques are woodcut, wood engraving, and linocut. Amy Haney (2015) states that printmaking's fingers have extended throughout history. Printmaking has had an impact on lives and societies. The influence of printing has dictated the growth and direction of religion, culture, education and society. It manifests itself in various ways, from straightforward to intricate approaches. We have been exposed to the benefits of printing throughout our lives.

2.2 Woodcut

The technique involves the use of a plank of wood or plywood. The artist draws an image and then carves wood. Only one or two colours can be applied to the block simultaneously. If many colours are required, a separate block must be provided and carved for each. The most important thing is that the image must align precisely with all the images from the other blocks.

2.3 Wood Engraving

Wood engraving is a little bit different from woodcut. In this printing, a piece of boxwood is cut perpendicular to the grain of the wood. Unlike woodcut, wood engraving is an excellent form of woodcutting. Using blocks made from the end-grain of wood, the artist can work in detail and tonality. Wood engravings are usually small. Usually, the block size is under 5 x 6 inches because boxwood does not grow very big.

2.4 Linoleum Cuts

Linoleum cuts or linocuts are almost identical to woodcuts; only the material is different. The artist works on battleship linoleum that is commonly used in the kitchen today. All the processes, including the inking, are identical to woodcuts.

2.5 Stamped Prints

This printing is the most basic of all print processes, and it consists of simply applying ink or paint to something and transferring the ink to the surfaces to be printed. This process includes such simple things as rubber stamp prints, potato blocks, fingerprints and handprints.

2.6 Wastage Material of Natural Resources

In previous years, the deterioration of waste management and the environment of the wood-based product has become a global issue among developing countries. Recyclables and environmental safety have become increasingly essential and consumer pressure on the material manufacturer. The products should consider their products' environmental impact at all stages of their life cycle, including ultimate disposal of wood flour or wood waste (Peijis, 2002). Wood waste is primarily from construction projects, land clearing, and wood-based industries. The wood-based industry especially comes from the pallets and packaging, which reach almost 70% of the original wood volume (Suttie, 2004). Wood waste can usually be a valuable secondary material because it can be used in various processes such as particleboard, flakeboard, fiberboard, and others. As a developing country, Malaysia has the same products based on wasted material. Wood-based industries, particularly sawmilling, plywood, moulding and chipboard, have expanded rapidly since the 1980s. More than 5000 manufacturers are currently involved in wood products, including sawn timber, veneer plywood, mouldings, medium density board, and furniture (Anonymous, 2005). According to Anna Thibodeaux, solid wood alternatives are agricultural waste like wheat straw, rice straw, sugarcane fiber and barley straw. Aided by special resins, these alternatives were compressed into products such as particleboard and medium-density fiberboard (M.D.F.).

2.6 Composite

The following definition—which Jartiz provided—is the most frequently used: "Composites are multifunctional material systems that provide properties not possible from any discrete material. They are cohesive constructions created by physically joining two or more compatible materials yet differ in composition, traits, and occasionally form. This definition's flaw is that it categorises any material mixture as a composite without specifying its specificity or the laws that should apply to it to set it apart from other meaningless, mundane mixtures. Kelly makes it very apparent that the composites should not be thought of as a straightforward mix of two materials. In a broader sense,

the combination has unique qualities of its own. It is significantly different from either of the components alone or superior in terms of strength, heat resistance, or any other desirable feature. According to Van Suchetclan, composite materials are heterogeneous substances made up of two or more solid phases that are in close touch with one another on a microscopic level. On a microscopic level, they can also be considered homogeneous materials because any part of them will share the same physical characteristics.

2.7 Natural Fiber Composites

In terms of industrial uses and fundamental research, interest in natural fiber composite materials is expanding quickly. Renewable, inexpensive, fully or partially recyclable, and biodegradable. In the composites business, natural waste fibers such as bagasse, kenaf, rice straw, bamboo dust, banana leaf, etc. have been utilised together with wood since the dawn of time. Their availability, renewability, low density, cost, and good mechanical qualities make them an attractive ecological alternative to wood composite and synthetic fibers used in the production of composites. The composites incorporating natural fibers are utilised in transportation (automobiles, railway coaches, aircraft), military applications, building and construction (ceiling panels, partition boards), packaging, and consumer goods. As is widely known, this research is also a response to the United Nations 17-goal sustainability campaign and is related to SDG12. They can be included in composite materials. Additionally, they can be matted into sheets to form paper or felt.

3.0 Methodology

In this research, the researcher will be producing the various considerations taken as methods in this study, such as research design, identification of study, data collection, statistical instrumentations, and a flow chart of research methodology.

3.1 Research Design

There will be two approaches to this study that is quantitative and qualitative (Figure 1).

3.2 Quantitative Approach

A quantitative approach is a systematic, scientific investigation of quantitative properties and phenomena and their relationships. Some of the various considerations include ethnography, ethnology, oral life history, case study, focus groups, and conversation analysis.
Since this research will be using an experimentation process, the quantitative approach applies because the materials will be measured in a fixed formulation process.

3.3 Qualitative Approach

On the other hand, the qualitative approach involves an in-depth understanding of human behaviour and the factors that govern human behaviour. It investigates the why and how of decision-making compared to the quantitative method: what, where, and when. Therefore, this project uses the qualitative approach for smaller but focused samples rather than large and random samples. In testing the prototype, the researcher has prepared questionnaires for respondents and conducted interviews. The researcher will then analyze the questionnaire answers and interview respondents to assist the research project.

3.4 Identify Of Study

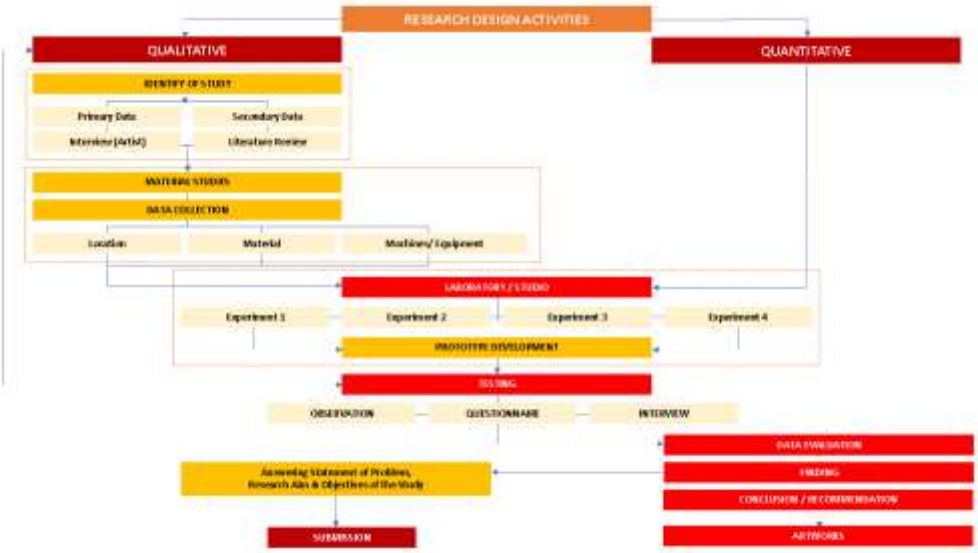

Fig.1: Research Design Activities

Information will be obtained from the primary and secondary data to facilitate this research further.

Primary data:
Interviews with printmaking artists will be conducted to source data that will support the problem statement and objectives.
Secondary data:
Books and internet sources will also become references that will support this study.
Data Collection:
Natural fiber wastage is readily available in Malaysia, such as wood dust, rice straw and bagasse. However, these products are sometimes more readily available in certain areas than others.

4.0 Conclusion

This research intends to look into the results that will benefit many parties, including researchers, printmakers, fine artists, art students, designers, entrepreneurs and others in the printmaking and art industries. The qualitative data of this study through a semi-scientific laboratory and studio model will potentially support the researcher to explore the potential of natural fiber wastage as a substance to develop a matrix for printmaking in artistic practice and to sample a prototype through developing, testing and evaluating processes of natural fiber waste composite for printmaking matrix.

Significantly, this research also supports SDG12; Worldwide consumption and production — a driving force of the global economy — rest on the use of the natural environment and resources that continue to have destructive impacts on the planet. Over the last century, economic and social progress has been accompanied by environmental degradation that endangers the very systems on which our future development — indeed, our very survival — depends.

Acknowledgements

The authors would like to acknowledge the Universiti Teknologi MARA (UiTM), Research Management Centre (RMC) and Research Nexus (ReNEU) UiTM for the financial support under the MEE Publication Funding Program, Universiti Teknologi MARA (UiTM).

References

Adelfa Apolinario, (2004). Study on the production of briquettes from bagasse Retrieved June 8th, 2021 from http://www.sra.gov.ph/absird06%20(sugar%20and%20co-products%20utilization%20-%20bagasse).html.

Art BoardsTM Natural Fiber Art Panel Retrieved June 2nd, 2021from. http://www.art- boards.com/Nat%20Fib- SolidCoreConstruction.html

Anna Thibodeaux, (2000). Wood Alternatives. Retrieved May 26 ,2006 from ; http://www.modernwoodworking.com/00issues/december/news/design2.htm

Anonymous,(2004) “Linoleum is more expensive” Retrieved Mac 23th ,2006 from http://www.ecoact.org/Programs/ Green_Building/green_Materials/linoleum.htm

Annie Bissett, (1995). It was difficult to carve because it's splintery. Retrieved June 12, 2006 from http://woodblockdreams.blogspot.com/2005/10/trying-out-some-lauan-plywood.html

Anonymous, (2005). Market Watch 2006 –Sector Timber. Malaysian – German Chamber of Conferences. October 12.

Alps, (1996). Contemporary Printmaking in the Northwest. Sydney: Craftsman House. Green Mission Picnic and Party Line, the sugarcane fiber called “bagasse or begesse. Retrieved April 12 ,2006 from http://www.sustainablebizness.com/gm_products.htm

Haney, A. (2015). History and techniques of printmaking (Order No. 1590440). Available from ProQuest Dissertations & Theses Global. (1694750725). Retrieved from http://search.proquest.com.ezaccess.library.uitm.edu.my/dissertations-theses/history-techniques-printmaking/docview/1694750725/se-2?accountid=42518

He, W. (2005). Dao in the creation of woodcut printmaking: A philosophical investigation into dao, chinese seals and woodcut practice to create a sigillographic language for black and white woodcut printmaking (Order No. U205820). Available from ProQuest Dissertations & Theses Global. (301658066). Retrieved from http://search.proquest.com.ezaccess.library.uitm.edu.my/dissertations-theses/dao-creation-woodcut-printmaking-philosophical/docview/301658066/se-2?accountid=42518 Kate Greenaway ,(1901) Rev Bucky (2005). “woodblock was costly”. Retrieved Mac 23,2006 from http://www.speel.demon.co.uk/artist2/greenway.htm

Lois Alan, (1997). Contemporary Printmaking in the Northwest. Sydney: Craftsman House.

Lemmens, Soerianegara and Wong, (1995). “Jelutung wood has become rare and expensive on the local markets” Retrieved June 19 ,2006 from http://66.102.7.104/search?q=cache:kFWhHCYMngIJ:www.unepwcmc.org/species/tree_study/pdfs/3.pdf+jelutung+wood+is+very+expensive+in+Malaysia&hl=en&ct=clnk&cd=9&client=firefox-a

Long Thien Shih , (1993).Communication in Graphic – Printmaking, National Art Gallery Kuala Lumpur. Materials most commonly used for this technique are wood and linoleum. Retrieved Mac 23 ,2006 from www.art.eku.edu/programs/print/tech/linoleum.html

Mohd Aripin, Nur & Matrahah, Izaddin & Ramli, Ishak & Amin, Ponirin & Amin, Rahman. (2016). Printmaking Terminology: Correlation on Definition Study Between Matrix in Printmaking and Ready-Made Material Mould in Industries. 10.1007/978-981-10-0237-3_54.

Quantitative Approach (n.d) Retrieved May 05, 2006 from http://en.wikipedia.org/wiki/Quantitative%5Fresearch

Qualitative Approach(n.d) Retrieved May 05 ,2006 from http://en.wikipedia.org/wiki/Qualitative%5Fresearch

Printmaking technique (n.d). Retrieved June 15 ,2006 from http://www.experimentalarts.com/lessons/releif_printing.htm

Peijis, T.; Cabrera, N.; Alcock, B. (2002). in Proc. of 9th International Conferences of Fibre Reinforced Composite- FRC 2002, Gibson, A.G (Ed) : March 26-28 , 2002. Newcastle upon Tyne, UK

Rick Carr,(2006).Carving through the plywood end grain would be difficult. Retrieved June 19 ,2006 from http://66.102.7.104/search?q=cache:ajRvpgPsS-8J:www.ringlibertyring.com/+plywood+is+difficult+to+carve&hl=en&ct=clnk&cd=6&client=firefox-a

Richard S. Field. (n.d). Contemporary Printmaking in the Northwest. Sydney: Craftsman House

Shamsuri Sulaiman. (2004). Research Methods for the Social Sciences Made Simple. Selangor: DSS Publishing Enterprise.

Sasha Grishin , (1993). Australian Printmaking in 1990s – Artist Printmakers 1990 – 1995 . Sydney : Craftsman House .Synthetic fibers, foam, sugarcane fibres, Retrieved June 23 ,2006 from http://www.valvan.com/htmlENG/horizontal.html

Suttie, E. (2004). Wood Waste Management- UK Uddate Final Workshop COST Action E22 'Environmental Optimisation of Wood Protection' Lisboa- Portugal, 22-23 March. Ukiyo-e(n.d) Retrieved January 09 ,2006 from http://en.wikipedia.org/wiki/Ukiyo-e

Urs Buehimann,(2002). Recycling Woods A Supplement to Recycle Works . Retrieved April 10, 2006 from: http://www.ncsu.edu/woodrecycling.

Youngquest, (1986). Mechanical Properties and Dimensional Stability of Acetylated Aspen Flakeboard . Holz-asl-Roh-Und Werkstoff 44:453-457