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STUDY ON GREEN TECH KNOWLEDGE OF CONSTRUCTION WORKFORCE AND EMPOWERMENT OF KNOWLEDGE IN CONSTRUCTION

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ABSTRACT:

The construction industry is one of the major sectors responsible for energy efficiency, solid waste production, global greenhouse gas emissions, environmental damage and resource depletion. However, there have been a few studies that point to green technical knowledge in the empowerment of workers in construction projects especially in Malaysia. The purpose of this study was to obtain information on raw materials between engineers, contractors and other organizations involved in the construction industry. To this end, extensive literature reviews, questionnaires and interviews were conducted. A number of projects involved in green technology and improvements in the development of existing conservation and construction technologies have been investigated; and how it was decided how the green technology industry could contribute to the national economy.

A questionnaire was distributed among the participants in the project and a discussion was held with local authorities in Selangor on their knowledge of green technology and to improve the development of green technology projects in Selangor and across the country. Through a survey of interviewed professionals with green construction expertise, the results initially showed that green technology is widely understood by key role players in the construction industry, but nevertheless implementation is not done and information about them is not well developed. Research vacancies are discussed with indicators of future research proposed. This research can serve as an important platform for both industry workers and researchers to appreciate the progress of green technology research.

I. INTRODUCTION

The green building, also known as a sustainable building, is designed to meet specific objectives such as the well-being of residents; use of energy, water, and other resources efficiently; and to reduce the overall impact on the environment. It is an opportunity to make better use of resources while building healthy facilities that improve

people's health, create a better environment, and provide cost savings. All development projects lead to overuse of natural resources. The government should support the green construction in each part of the country, and put in place laws or policies that can be easily understood. Encouraging green construction in factories that use green construction should be given incentives for the various forms to continue their green growth.

The Green Building, also known as the Sustainable Building, is the practice of building buildings and implementing environmentally friendly and efficient resources. It includes things like site selection, construction, construction, operation, renovation, renovation and reconstruction. The use of raw materials and products enhances global resource depletion. In addition, incorporating raw building materials into construction projects can help reduce the environmental impacts associated with the extraction, transport, processing, installation, installation, recycling, reuse, and disposal of these construction industry resources. Green Building focuses on building and implementing an environmentally friendly and resource-efficient process throughout the life cycle of a building. Since buildings use about 50% of the World's Total Energy, on the other hand, they consume less energy using energy-efficient materials. Therefore, the discovery of nearby green buildings can create a green area and provide a healthier environment with less tropical island effects.

BENEFITS OF GREEN TECHNOLOGY WITHIN A CONSTRUCTION COMPANY

The world of green technology solutions in the construction industry is rapidly evolving, and there are countless explanations for what green technology is and the related benefits. Simply put, green technology in the construction industry involves producing new buildings that include one or more environmental solutions. Green build raises the

barthe entire housing industry by establishing new standards of living and sustainability.

Most notably, companies with green solutions have also improved financial performance, compared to conventional businesses that do not use green applications. Business survival in the current difficult economic times requires efficiency and innovation. As a result, green restructuring and rapid construction become hallmarks of business efficiency.

GREEN TECHNOLOGY IN NEW AND EXISTING CONSTRUCTION

The main benefit of green technology is to save energy. In new buildings, the construction of green buildings plays a role in all stages of development. All aspects of a building, including planning, design, building materials, and systems used to run and maintain operations are selected to be as sustainable and energy efficient as possible.

In existing buildings, new green construction technology is being used to integrate existing control systems at the facility. Switch-building software with advanced software features are used to integrate all older systems that control electrical, mechanical, and building security features, and integrate them with a centralized control solution. This allows even older legacy systems to work together so that owners can see the benefits of new green technology.

- Energy Conservation
- Water saving
- Reducing Hosting
- Improving health and productivity

OBJECTIVE OF WORK:

The purpose of the green building concept is to build buildings that use less natural resources during construction and operation. The green properties emphasize the efficient use of resources and also press three Rs - Minimize, Reuse and recycle.

The green construction method enhances the use of functional building materials and practices; increases the use of natural resources and sinks around the building; reduces energy consumption; uses the most efficient internal space equipment; uses the most effective methods for water and waste management. Household appliances including lighting, air-conditioning and all other necessary items.

The Green Building is a team effort and design and construction include supervisors from building and field construction, air conditioning, plumbing, energy and power stations. These consultants should assess the impact of each design on the environment, taking into account the costs involved. The final design needs to be done and should minimize the negative impacts the building will have on the environment.

The implementation of the green building concept could lead to a reduction in carbon emissions by 35 percent, 40 percent water consumption, 70 percent solid waste reduction and 50 percent reduction in energy consumption. The concept of Green Building also emphasizes that an area with a rich biodiversity should be avoided as a building site.

To ensure a small negative impact on the environment through the construction and operation of the building, the things to keep in mind are - to maintain the external environment in the building environment; to improve the interior space of the occupants of the building; and maintain areas not adjacent to the building.

II LITERATURE REVIEW

- Halford said, "Builders and buyers often see green homes as the most expensive to live in but the most expensive to buy". According to his survey, "67 percent of respondents say that they believe a completely green home would be worth living or maintaining. The same answer was given by 65 per cent of middle income, 59 per cent of middle income and 48 per cent of low-income consumer respondents. However, when asked if a green home would be more expensive to buy, only the top respondents responded the most, with 71 percent, compared to 47 percent of low-paid respondents who said they believed a completely green home would be less expensive to buy. Part of the survey builder found that 87 percent believed that green homes were expensive for middle-income families to live in, but 30 percent felt that green homes were not in a position to buy or build. The difference is even greater when it comes to low-income families. 70% of homeowners say they believe that green homes are expensive to live in this category, but about 60% think that green homes were not for low-income families to buy or build ". While this requires a down payment on initial costs, data shows that future savings on energy, water and repair costs often make this a good investment. After all, green features have a greater impact than project costs.
- Childers quoted Jeff Komblau, director of marketing and marketing for Eagle Construction of VA, "We wanted to reach the bottom of our homes to inject quality that is invisible but creates comfort and is evident in the monthly savings and low carbon mark".
- Chadwick in his study of Green Building Construction explained, "New developments are being made every day in the field of engineering designed to save electricity and protect the environment. This is a very important time to be aware of energy consumption, due to global warming. Naturally there will be professionals who are constantly innovating in the field, but another big question is whether there should be laws and regulations that force people to make or use raw and engineered products. While the construction of a green building may seem costly to consumers, new developments in the field of engineering provide increasingly costly solutions ". He added, "Although green engineering is at the forefront of society now, it has been around for many years. Solar energy is the most popular way to save energy. Solar panels can reduce energy consumption in a building by generating their energy from the sun. In some cases, structures can also bring back excess energy to the power grid. However, solar energy is only suitable for certain regions. While some areas receive more daily sunlight, such as Arizona, others receive less or less sunlight, such as Alaska. This technology has been around for a long time, but it is still growing in popularity, as well as quality".
- Chadwick, in his green building study, explains that, "green engineering methods are rehabilitating the environment by reducing energy consumption, other strategies that can help local living directly. The green roof is starting to be very popular and successful. A single green roof with a layer of soil and vegetation growing on it. It benefits the building and the living space in many ways. It helps the environment; by providing accommodation for wildlife that may have existed before the construction of the building. The water flow from the green roof also draws cleaner than

it did before it hit the roof. The green roof also benefits the building, as it is more flexible, blocks the hot summer sun, or keeps heat out of the building during the winter (Green building includes). The green roof has actually been around for about five years and is often installed on large city buildings ”.

- Springston stated in his study that “Sun Trust Bank in Richmond has transformed the top of a four-storey building on the city's Main Street into a 11,800-square-foot [11,800 sq m] green roof covered with drought-tolerant vegetation and absorbs storm water. The Virginia Association of Counties also covered their 3,000-square-foot roof last year with a sprawling plant system ”.
- URies et al. In their study of the economic benefits of green building they point out, “One of the ways in which we are developing is to conserve hot or cold air. The California Academy of Sciences building has openings in the house to ventilate hot air and car windows to let in cool air (Green building includes). While this can control the temperature in a building well, air quality is very important, because, on average, people spend 80-90% of their time on buildings. There is a constant battle between maintaining a constant temperature while using less energy and keeping the air clean ”. Most air-conditioning and air conditioning systems advertise providing accurate temperature control and filtering for mold, moisture, dust, and pollen. There are currently no technologies that can meet the same standards while using very little power..
- White and Raine (2008) state, “2.5% of the world's water supply is clean, 70% of this water is frozen, and below it is available for human consumption. This makes water an environmental problem and water conservation is the goal of green engineering. There are many simple ways to reduce water consumption. The Luck Stone corporate offices use waterless urine, slow-moving toilets, and a personalized irrigation system, a technology that can be used in almost any office building. Urine is waterproof and toilets have a 2-point lever for little or no light. The irrigation system gets its water from a man-made pond in a building that regularly collects rainwater and run-off. By collecting all the water in the pond and filtering it, the contamination can also be removed. This plan keeps Luck Stone from taking over any area in the area that goes to irrigation ”. According to research, such green technology should be well suited to the building and the environment. Many of these technologies can be integrated into the design of large buildings or office spaces.
- According to Chadwick, “the use of natural light has become increasingly common in major new buildings. Buildings can have plenty of space lights and windows to get natural light deep inside. Artificial lighting in the building may dim or turn off when there is sufficient natural light. This light source was used at the California Academy of Sciences in San Francisco at the Gold Gate Gate (Green building includes). Another light-efficient building, close to home, is the new Luck Stone company office building in Goochland. There are many windows and skies that emit natural light. Most of these windows face north, where possible, with a small amount of direct light. Direct sunlight on a building can lead to unwanted internal heat. There is also a small hanging outside the standing windows to block out direct sunlight and to let sunlight on the roof with slightly angles. This roof then leads the light forward in the building. Luck Stone is currently working on disassembling the roof lights to incorporate different sensors and

condensers into them so that they can adapt to different levels of natural light. ”

- In their study, Ries et al. It explained, "In architecture and architecture, green and architectural methods are considered in many new construction projects. Final decisions are often made solely on the basis of schedules and budgets, and the long-term consequences are often overlooked. carefully between the initial additional construction costs compared to the recurring, long-term benefits associated with cost savings is required to conduct a comprehensive analysis ". They also quote, “It often seems out of place for a company to make a change, but most of the time when a company looks at a bigger picture they will feel differently. However, some people believe that engineers should be forced to change their methods in order to make changes in architecture. Engineers, however, are not particularly fond of this idea. They know that new technologies are not always reliable and should be tested and modified for a while to continue ”.
- Abair in his study on the emergence of green building codes stated, “LEED is also used as a compulsory standard. Boston was the first major city to authorize the use of green engineering in buildings. From the beginning of 2007, any new building with more than 50,000 square meters and any existing building with more than 100,000 square meters under construction should receive, at least, a minimum LEED certificate. Shortly after the launch of the Boston program, Washington, DC passed a similar law, "creating an expiration date ending January 1, 2010, after which all new projects must meet the LEED certification standard." He goes on to say, "There will be a gradual increase in demand, where all major residential buildings will be LEED-Silver Certified and all major commercial buildings will be LEED-Gold Certified.
- This one law in San Francisco alone will have a huge impact soon. Jesse Abair, a construction and environmental advocate, predicted that "by 2012 the law will reduce carbon emissions by 60,000 tons, save 220,000 megawatts of energy, save 100 million liters of drinking water, reduce wastewater and storm water by 1 million liters. -90, reducing construction and demolition waste by 700 million pounds, increased recycling costs by \$ 200 million, and reduced motor vehicle traffic by 540,000 ”.
- According to Ries et al., “Environmental engineering has already succeeded in many major buildings. In Pittsburgh Pennsylvania, a new prefabricated concrete building was constructed using raw materials that were then closely monitored for results. Finally, factory production increased by about 25% and energy consumption by about 30% ”. The construction of green buildings has seen rapid growth in popularity and importance. Many businesses use this dynamic sector and promote multiple changes at the same time. Companies have started selling raw products, participating in ‘environmental conservation’ campaigns and encouraging consumers to be ‘green’. Tim Thompson, owner of Code Green, a Richmond-based company puts all the effort into incorporating 'green' into business plans. "People are becoming more and more accustomed to the fact that a good company is the company they want to do business with," he said.

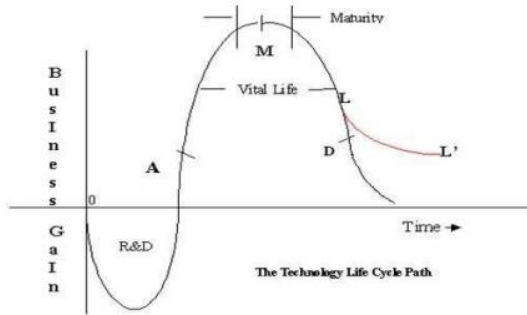
III METHODOLOGY

Green technology has become an integral part of sustainable construction projects in view of the significant impact on the built environment. Its prices are influential and comprehensive, offering significant advantages when used in new facilities and in current construction. The purpose of this paper is to highlight the importance of moving from conventional technology to green technology to achieving sustainable construction projects, identifying the costs and

challenges of adopting green technology in construction. This paper uses a systematic review of various publications to expose the explosion of green technology applications in the first solution to logical psychological problems such as declining returns, unstable investments, waste prevention, etc. A sustainable design principle with a good understanding of the technological life cycle is used.

The Cycle of Technical Health

The technological life cycle is very different from the product life cycle. The first applies to product performance in the market sector while the strengthening of the technological life cycle focuses on the various stages of technological growth in the production and operation of technology in relation to industrial progress.



The Importance of Green Technology

Raw technologies, conservation technologies are developed and used in a way that protects the environment and also protects natural resources. Part of the renewable energy branch of environmental technology, the importance of green technology cannot be ignored. We have come to the point where we need to stop and think about the importance of green technology and the growing importance of humanity. For many reasons the importance of green technology, perhaps volumes can be written and discussed on that subject.

MAJOR BUILDING FEATURES

- Eco-Friendly-by disruption at least in the eco system
- Save energy by using natural cooling air and synthetic solar designs
- Water efficient use by reusing and harvesting water
- Utilization of renewable energy through voltaic systems of images and solar system etc.
- Non-toxic organic matter
- Use of recyclable / recyclable materials
- Proper use and disposal of waste

PRINCIPLES OF GREEN BUILDING

- Ongoing Site Construction
- Water Quality and Conservation
- Energy and Environment
- Internal Natural Quality

Building materials and equipment

Challenges to Adoption of Green Technology in Construction

In general, it can be considered that green technology is more expensive compared to other replacement technologies because it balances the greenest costs that can be addressed in many common inventions. Although green technology is relatively new and innovative, the capacity to continue, and to implement, costs can make it more expensive compared to older technologies. Although, the benefits are considered and depend on other factors such as supporting infrastructure, technical interests, staff skills, and facilities. The adoption and use of green technology has some drawbacks due to

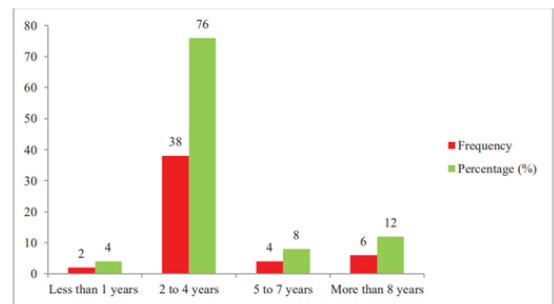
many other potential cultural barriers, such as the lack of a proper regulatory framework; or technical, economic, political, cultural and legal in nature. Moreover, from an organizational point of view, these barriers to accessing raw technology include; including, impact performance uncertainty, insufficient funding, and skilled staff. However, overcoming obstacles can be difficult. Supporting 'green' growth and requiring the identification and removal of these barriers to the widespread use of green technology in many developing countries

ANALYSIS OF RESEARCH WORK

Data Collection

In this study, a constructive survey and interview was conducted to gather professional ideas on the adoption of green technology in Malaysia. The methodology of this study contains a number of methods and procedures that can guide the collection and analysis of data during the study. The stages of the process are arranged sequentially to ensure that the product, quality and purpose of the research is achieved. It also ensures the smoothness of the work and can avoid negligence and simply make mistakes during reading. In this study, data were collected using two methods:

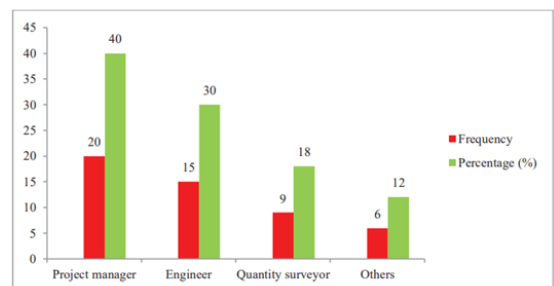
- stakeholder survey questions related to site construction; and
- consult with a specialist of the selected company.



Years of the respondents' experience in the construction industry



The respondents' company types



The respondents' profession

RESULTS AND DISCUSSION

The study compiled and used information from critical reviews of existing survey questionnaires distributed to respondents and analyzed to achieve research objectives. The data obtained was analyzed and the reports of others were reviewed as well as the information obtained from this study to develop engineering recommendations.

The lesson focuses on the following:

- Number of projects involved in green technology in Selangor;
- Provide green technology in the economy
- Recommendations to improve the development of current green technology in Selangor.

Information on the list of construction projects in Selangor is needed to achieve the objectives of this study which is to find out the number of projects involved in green technology in Selangor and to investigate the green technology industries that contribute to the country's economy. The list of new construction projects received by the Construction Industry Board (CIDB) in Malaysia shows at least 129 projects held in Selangor this year from 1 January 2017 to 6 November 2017. The gap between general construction projects is much higher than green technical projects containing the type of construction in Selangor (2017) shows that 105 (81%) projects are not built in the normal way and 24 (19%) green technology projects are implemented from January to November 2017. All this data is available from the Construction Industry Development Board (CIDB) Malaysia as the list is divided between a typical construction project and a green technology construction project. Given the number of construction projects and the percentage of construction in Selangor participating in green technology projects, it is shown that the use of green construction technology is still low. In projects involved in green technology and the construction of construction projects, most of them come from road construction as the companies that did the work use the "mill and pave" system.

The Mill and pavement program in road construction is set in the field of green technology development that contractors have used these days to repair and build new roads. Mill and pave are considered a green construction project because the recycling process as the tarmac has been removed and is set to be used as a new road mix. This approach is based on the green concept where the compound is reused on a new road to ensure that there is no compacted debris and can be used in a hot asphalt mortar mixing with aggregate and asphalt cement binder or recycling agent. This minimizes the impact of regeneration on the environment.

The purpose of this study was not only to identify the use of concrete waste in comparison with the economic perspective but also to investigate the feasibility of using materials from reconstructed structures.

It is hoped that the findings of this study will encourage professionals to use second-hand materials in new buildings.

1. The use of a combination of demolished and construction waste on new concrete as recycled concrete reduces pollution and provides an economic value for waste.
2. Study the use of demolished and construction waste instead of natural aggregate.
3. To study the mechanical and physical properties of demolished and constructed material by constructing an exploration function.

We must follow all the necessary technologies

POSSIBILITY OF FORMATION OF BUILDING MATERIALS

Lassandro argues that the economic definition of interventions aimed at reuse of goods / materials can be based on the following assessments: -

- Potential demolition costs (controlled or selected demolition, reconstruction, cake selection);
- CDW transportation costs;
- Waste disposal fees and waste treatment center fees;
- Eco-tax, e.g. in Italy there is a separate eco tax in each region;
- The cost of CDW treatment at the construction site;
- Revenue from recycling (savings amount).

V CONCLUSIONS

- Green building concepts help keep pollution clean. Green construction is a financial, health-wise, and most important environmental concept that many people need to adopt. Many building materials and renewable energy sources are available to reduce human impact on the environment. By educating, making natural products more accessible and reliable, and by providing government incentives it is possible to encourage more people to embrace green construction and all the benefits that come with it.
- In conclusion, out of the 129 construction projects held from 1 January 2017 to 6 November 2017, only 24 of them have used green technology concepts in their construction work. The minimum amount of this result can be one step in developing the green technology for this company. It can be concluded that Malaysia is advancing the green ideas of other construction industries. Malaysia should have more experts in the development of green technology because the lack of experts makes the knowledge of the concept of green technology less likely to be disseminated to others. Even many industries are trying to use the construction of green technology, but without an expert or technician or person who knows about green technology, development can be problematic where it can look at common construction similar to a green technology construction project. In conclusion, Malaysia must have more experts in the development of green technology because the lack of experts makes the knowledge of the concept of green technology unusable. Even many industries are trying to use the construction of green technology, but without an expert or expert who knows about green technology, development can be problematic where it can look at a common construction similar to a green technology building project.
- In modern construction projects, green technology is used to provide growing demand and higher market prices for their equipment.
- Even more infrastructure owners benefit from lower continuous operating costs, improved maintenance costs, and higher property costs. Many of these green technologies are used in buildings to integrate control systems installed in multiple frameworks.
- By effectively controlling infrastructure processes, the construction industry can produce better products while maintaining efficient operating systems, and reducing operating costs, as shown earlier in this study. In all indications, the perspective of this paper suggests that it is possible for energy to be better developed by eliminating unnecessary energy consumption and saving

up to 30% of energy making green technology more valuable.

- Although, many developed countries such as the USA, China and the UK are using vista and opportunities faster in the use of green technology. However, many developing countries such as South Africa are still struggling to embrace the green technology in their construction industries and are probably opposed to the cost of its implementation.
- However, this study shows that resource conservation and sustainable construction can only be achieved in developing countries such as South Africa where green technology is being used continuously in construction projects.
- Further research should be directed at identifying the views of various stakeholders on the successive implementation of environmental technologies.
- As a last resort, after the 21st century, much attention has been given to sustainable development, and in any given land in any country to achieve its sustainable goals, it is acknowledged that the adoption of green technology in their construction activities is essential.

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