

AcE-Bs 2013 Hanoi
ASEAN Conference on Environment-Behaviour Studies
Hanoi Architectural University, Hanoi, Vietnam, 19-22 March 2013
"Cultural Sustainability in the Built and Natural Environment"

Green Roof: Its awareness among professionals and potential in Malaysian market

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Abstract

This paper discusses the awareness of green roof technology among Malaysian professionals in built environment industry and its potential in the country's market. A total of 30 projects of local green roofs has also been identified and used in this study. Online survey is used as the tool to get feedback from the professionals who are the professional, in the construction discipline, the landscape architect, architect, developer, government officer, urban planner, project executive and also academicians.

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Selection and peer-review under responsibility of Centre for Environment-Behaviour Studies (cE-Bs), Faculty of Architecture, Planning & Surveying, Universiti Teknologi MARA, Malaysia

Keywords: Green roof; awareness; professional involvement; green roof market

1. Introduction

Green Revolution is the main theme of the era in 21st Century. Many scholars around the world are investigating and promoting the importance of green revolution by the use of green technology to reduce the impact of global warming. Urban heat island, high energy demands, air pollution and lack of green spaces are among Malaysia's most crucial environmental issues in its urban areas like Kuala Lumpur, Pulau Pinang and Johor Bahru. In 2009, at the United Nations Climate Change Conference in Copenhagen, Denmark, Prime Minister of Malaysia, announced Malaysia's target to decrease 40% of released carbon dioxide until 2020 (Anandaraj, 2011). Therefore, numerous steps have been taken by the government to realize their green mission. Among the strategies are the establishment of Malaysia Green

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Technology Corporation (GreenTech Malaysia), enactment of legal mechanisms to regulate and enforce green technology, and to define the role of every government agency involved in the implementation of green technology in the country. An example of the initiative is the region's largest green technology exhibition and conference, International Greentech and Eco Products Exhibition and Conference Malaysia (IGEM), organized by Ministry of Energy, Green Technology and Water (KeTTHA) every year since 2010 (3rd IGEM, 2012). On 15th January 2013, as announced by Minister of KeTTHA, the theme for IGEM 2013 is "Advancing Green Growth". The aim is to enhance and strengthen the adoption of green technology in the country (4th IGEM, 2013). Green building is part of green technology whereby green roof is one of the approaches to create sustainable green cities development. In order to achieve a sustainable development, awareness about green roof among all classes of society is vital to make it successful. Moreover, the involvement of professionals in built environment to adopt the technology in the future development is necessary. Even though, green roof is not a new phenomenon, its application in the country is still rather limited.

This paper discusses the awareness of green roof technology among professionals in Malaysian built environment industry through a survey. The aim of the survey is to investigate green roof awareness among the respondents and its potential in the Malaysian market. The findings are based on the results of the survey from professionals comprising of landscape architect, architect, developer, government officer, urban planner, project executive and also academicians within the construction discipline. The total number of 120 respondents participated in this survey.

Green roof is a vegetated system where plants are planted on the roof using an engineered growing medium laid on certain layers of the system (Tan, 2008; Dunnett et. al, 2011). From the world's perspectives, green roof industry started in the early 1970s in Germany, and in the mid-1980s in Central and Western Europe. Singapore, Eastern Europe and USA started in the early 2000s while Hong Kong, Manila and China only started adopting the green roof system in the mid 2000s (Ho, 2011). Green roofs in Malaysia are becoming increasingly popular recently not just because its aesthetical value but also due to its positive impact on environmental issue. The two major types of green roof are intensive and extensive (Osmundson, 1999). Intensive green roof is also known as roof garden of which the plants comprise of trees and shrubs and needs regular maintenance. Therefore, the system requires specific support from the building as it is generally heavy. However, this type of green roof is accessible. Extensive green roof is lighter compared to intensive green roof in terms of loading. It is less expensive and requires low maintenance, but the selection of plants is rather limited than intensive green roof. It offers limited accessibility as most of the time, it is only accessible for maintenance purposes. Each type of green roof has its own advantages and disadvantages. Therefore, the purpose of having a green roof should be determined and understood before selecting the best type of green roof to meet the goal of a project.

Green roof is one of the methods to sustain the environment (Köhler, 2001). Previous research done on green roof proved that green roof had many economic, environmental, and social benefits (Getter & Rowe, 2006; Oberndorfer et. al, 2007). Economic benefits include increasing the marketability of the building land properties in branding it as a green building (Oberndorfer et al., 2007; Rahman and Ahmad 2012; Rahman et. al., 2012). Green roof is also one of the approaches in designing an energy efficient building as it helps to reduce the amount of electricity for air-conditioning units in the building. Zainordin et. al (2012) stated that air conditioner is a high energy consumption electrical facility in Malaysian offices (57%) due to the increase in demand to provide thermal comfort for building occupants. Green roof is beneficial to the environment through storm water mitigation (Mentens, 2006; Stovin et. al, 2012), carbon sequestration (Ismail et. al, 2012), flash flood reduction and also replenishing back greenery in the city (Brenneisen, 2003 and Miller, 2005). Malaysia has very dense greenery in rural areas but not in the city whereby the CBD areas mostly concrete jungle (New Straits Time, 2011). Use of green roof could

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