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THE ROLE AND SIGNIFICANCE OF ROOFTOP GARDEN TOWARDS SUSTAINABLE URBAN DEVELOPMENT IN MALAYSIA

Maryanti Mohd Raid¹, Khadijah Hussin² and Robiah Suratman³

^{1,2,3} Department of Real Estate,
Faculty of Geoinformation and Real Estate,
Universiti Teknologi Malaysia, Skudai,
81310 Johor Bahru, Johor.

(E-mail: mmaryanti86@gmail.com; khadijah@utm.my; robiah@utm.my)

INTRODUCTION

Rooftop garden is a modification of modern landscape which has the potential to contribute towards sustainable urban development. Many studies have highlighted the role of rooftop garden as a tool to assist urban area to solve environmental issues effectively. Among its greater impact towards the environment are include mitigating urban heat island phenomenon, energy saving, maintaining thermal comfort, managing storm water and also improving the ecological value of the site through preserving habitat for small species of animal especially birds and insects. These roles are well documented and recognized in Europe as well as several Asian countries especially Singapore, Hong Kong and Japan. However, this article attempts to explore the role and significance of this landscape in Malaysia and how this landscape can assist cities to improve the living environment of urban dwellers. It is hoped that the research information from this article is useful to promote rooftop garden or green roof as one of the way to create a healthy environment living and a balanced between the physical development and preservation of urban green space in the city.

MAIN RESULTS

Based on the interviews with the respondents, most of them agreed that roof garden is one of the new strategies to achieve sustainable urban development. The benefits of this landscape are not only in terms of its aesthetics but also cover the social, economic and environmental aspects. Through the development of a rooftop garden, it will not only assist to solve urban issues, but also act as a passive recreation area that contributes to the social aspects of society. Besides, it also acts as a method to maintain and balance the preservation of green area in the city.

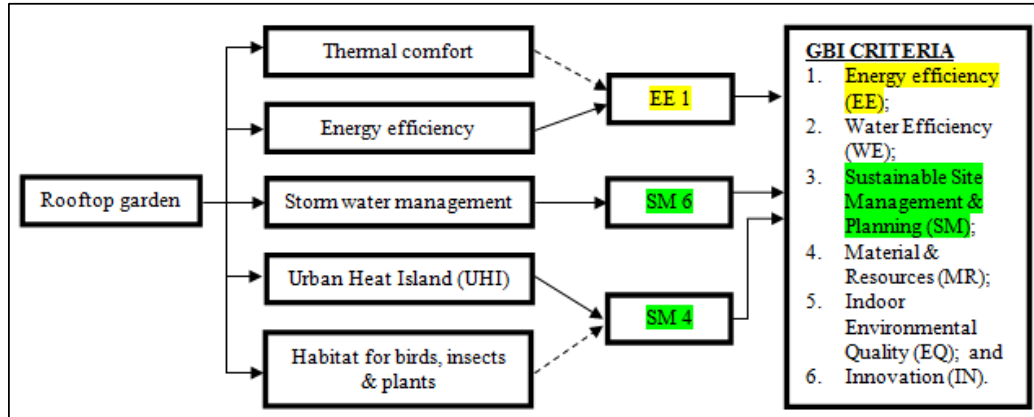


Figure 1. The possible contribution of rooftop garden in GBI assessment under New Residential Construction category.

In order to identify the GBI criteria and its scored marks in GBI assessment, reference was made on the document of GBI assessment for the case study. Based on the documents and confirmation by the developer representatives, the two out of five ecological benefits of rooftop garden at case study - mitigate UHI and preserve habitat for flora and fauna was assessed under Sustainable Site Management & Planning (SM). Besides, herbs garden also contribute to score marks under Innovative (IN) criteria.

Table 1. The detail GBI assessment for rooftop garden for case study.

Criteria Code	Description	Scored Marks
SM4	Open Space, Landscaping and UHI: 1. Minimized UHI 2. Improve biodiversity	4/37
IN 1	Innovative design and environmental design initiative. 1. Herbs garden	1/6

REFERENCES

1. Farhana Abdullah, Kei Saito and Ismail Said (2011). *The Influence of Green Plot Ratio on Urban Temperature: A Review on Implication of Urban Greenery*. 5th South East Asian Technical. University Consortium Symposium, Hanoi. 24th - 25th February 2011.
2. Hui, Sam C. M. (2010). *Development of technical guidelines for green roof systems in Hong Kong*. Proceeding of Joint Symposium 2010 on Low Carbon High Performance Buildings, Hong Kong. 23 November 2010.
3. Osmundson, Thompson (1999). *Roof Gardens: History, Design and Construction*. New York: WW Norton & Company.
4. Norazmin Adibah Othman (2007). *Kriteria Perancangan Dalam Pembangunan Perumahan Komuniti Berpagar di Kawasan Dewan Bandaraya Kuala Lumpur*. Ijazah Sarjana Pentadbiran dan Pembangunan Tanah. Fakulti Geoinformasi dan Harta Tanah. Universiti Teknologi Malaysia, Skudai.
5. Buletin Rancang Selangor (2008). Town and Country Planning Department, State of Selangor from <http://www.jpbdselangor.gov.my/Laporan/BuletinRancang/JPBDbulletin2008.pdf> achieved on May 18th, 2011.

6. Roslina Sapawi (2009). *Urban Heat Island Mitigation through Green Roof Technology*. Sarjana Pengurusan Persekitaran. Fakulti Kejuruteraan Awam, Universiti Teknologi Malaysia.
7. Sabariah, Nor Aini, Mas Rahayu, Hartini, Zarina dan Mohd Shukri (2008). *Potential of storm water capacity using vegetated roofs in Malaysia*. International Conference on Civil Engineering Practice (ICCE08), Hyatt Regency Kuantan Resort, Kuantan, Pahang.
8. Wong N. H., Chen, Y, Ong, C.L., Sia, A. (2003a). Investigation of thermal benefits of rooftop garden in the tropical environment. *Building and Environment*. 38. Pp 261–270.
9. Wong, N. H., Cheong, D.K.W., Yan, H., Soh, J., Ong, C.L. & Sia, A., (2003b). The effects of rooftop garden on energy consumption of a commercial building in Singapore. *Energy and Building*. 35. pp353–364.
10. Canero, R. F and Redondo, P. G. (2010). Green roofs as a habitat for birds: a review. *Journal of Animal and Veterinary Advances*. 9(15), 2041-2052.
11. Getter, K. L. and Rowe, R. B. (2006). The role of extensive green roofs in sustainable development. *HortScience*. 41. Pp 1276-1285.
12. Brenneisen, S. (2004). Green roofs – how nature returns to the city. *Acta Hortic*. 643. Pp 289-293.
13. Hui, S. C. M. and Chan, K. L., (2011). Biodiversity assessment of green roofs for green building design, In *Proceedings of Joint Symposium 2011: Integrated Building Design in the New Era of Sustainability*, 22 November 2011 (Tue), Kowloon Shangri-la Hotel, Tsim Sha Tsui East, Kowloon, Hong Kong, p.10.1-10.8.
14. Klemmer, R.S., Thomsen, M., Phelps-Goodman, E., Lee, R. and Landay, J.A. Where do web sites come from? Capturing and interacting with design history. In *Proc. CHI 2002*, ACM Press (2002), 1-8.
15. Schwartz, M. *Guidelines for Bias-Free Writing*. Indiana University Press, Bloomington, IN, USA, 1995.
16. Choo, S.M. Title of a master's or PhD thesis. Universiti Teknologi Malaysia, Ph.D. Thesis, 2012.