

Green Infrastructure in Cities and Towns in Southeast Asian Countries: Quest for Research

SECOND INTERNATIONAL SEMINAR ON SUSTAINABLE URBAN DEVELOPMENT

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Purpose

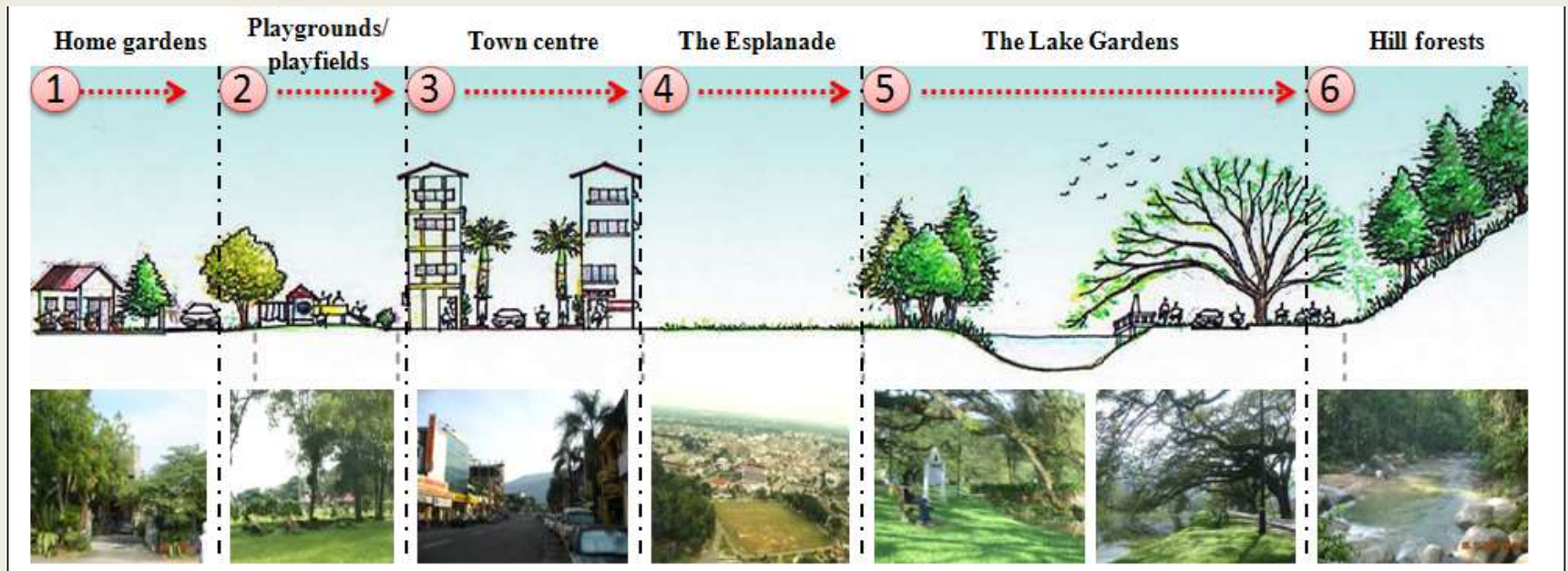
- This review highlights the roles of green infrastructure in cities and towns in Southeast Asian region.
- Research questions:
 - (1) What are benefits and issues concerning green infrastructure in Southeast Asian cities and towns?
 - (2) What are attributes of green infrastructure causing positive effects to residents' experience?

Urbanisation and Green Infrastructure

- By the year 2030, almost 50% of Asians people will live in cities
 - e.g. Urban population in Malaysia will increase by 78% by 2030.
- As the population increases, various environmental problems are generated - impairment of human health to economic and damage to urban ecosystem.
- Hence, healthy environment is essential for urban residents' well-being.
- Urban green infrastructure (GI) is a highly valued resource to countermeasure these urban ecosystem deteriorations.

Green Infrastructure (GI)

- GI is all landscape types comprise of greenery and open spaces.
- A network consisting of parks, open spaces, playing fields, hill forests, pocket spaces, small incidental greenspace and neighbourhood gardens that are linked by tree-lined streets and waterways, around and between urban areas.



Urban GI Research in Southeast Asian Countries

- Cities that are renowned for adequate GI should provide at least 20-30% of greenspace or at least 9m² of greenspace should be provided per inhabitant (the United Nation Food and Agriculture Organisation).

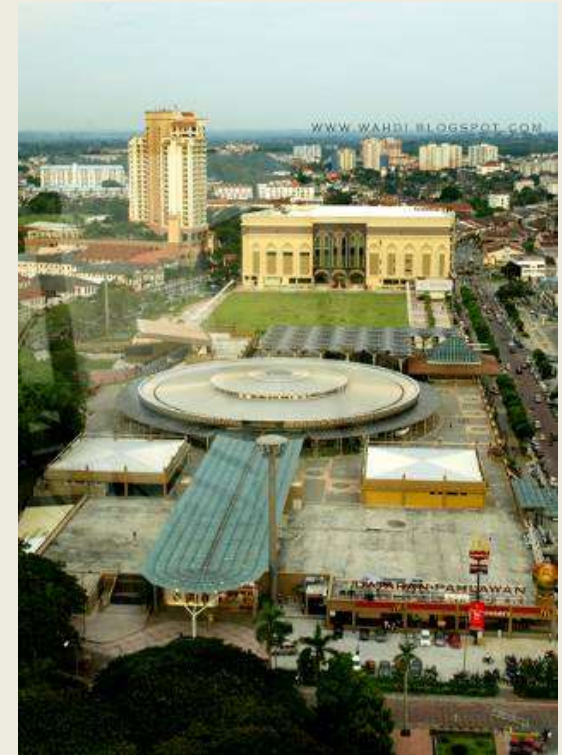


Research

Cities /Countries	Greenspace /city area	Greenspace(m ²) /inhabitant	Concern of research	Authors
Jakarta	9.6%	0.22	<ul style="list-style-type: none"> •Lack of greenspace due to competition with other physical developments. •Increases environmental degradation from the lack of greenspace. •Lack of awareness and sense of civic mindedness resulted in uncaring attitude of public. 	Sabarini, P. (2009); Pitakasari et al. (2010); Jakarta General Masterplan, 2010); Rustam (not cited); Aldous (2010); Kuchelmeister (2000)
Kuala Lumpur	15.5%	12.9	<ul style="list-style-type: none"> •Lack of proper planning, implementation management and reinforcement i.e. low standards of maintenance, lack of manpower and budget, •lack of skill, knowledge, expertise and interest. •lack of awareness and sense of civic mindedness. 	Mustafa & Osman (1999); Lillian et al. (2002); JPBD (2005, 2006); Yap <i>et al.</i> (2007); Streetheran <i>et al.</i> (2004; 2006); Gairola and Noresah (2010)
Singapore	46.5%	20	<ul style="list-style-type: none"> •Overcoming connectivity issue for urban residents' ease of movement and ecosystem benefits. •Park connector was introduced for well-being. 	Yuen (1996); Tan (2004); Briffet et al. (2004); Aldous (2010); Tanuwidjaja (2010)
Bangkok Cambodia Manila	39% - -	5 - -	<ul style="list-style-type: none"> •Lack of greenspace due to competition with other physical developments. •Lack of awareness that greenspace (roads, parks, gardens and water bodies are part of urban heritage (Symann, 2009) 	Rustam (not cited); Regional Plan of Area Arrangement (RTRW); Aldous (2010); Fraser (2002); Kuchelmeister (2000).

GI Challenges

- Almost all cities in the region (except for Singapore) have inadequate and poor quality greenspace. These are associated with poor social conditions, economic and environmental deterioration.
- One major cause of Jakarta's environmental degradation is the decline of vast green open spaces. A targeted proportion of GI provision fell from 37% (from 1985) to 9.6% or 50km² (in 2010).
- Areas of GI has to compete with other physical developments. It is constantly under risk of land acquisition, changes and modification.



e.g. A *padang* is substituted for a shopping complex in Melaka

GI Challenges

- GI is often being substituted, sacrificed and imposed to make ways for new developments in favour of development that is seen as more financial priority.



e.g. 'Fill-in' development in Beoung Kok, Phnom Penh
(Symann, 2009)

GI Challenges

- The existing GI is damaged due to functional shift from recreational greenspace to commercial areas.
- Lacks proper planning, implementation and reinforcement—
e.g. in Malaysia - low standards of maintenance, lack of manpower and budget, lack of skill, knowledge, expertise and interest, and lack of awareness and sense of civic mindedness.
In Cambodia – e.g. the public greenspace in the city is put under pressure whereby it becomes freely available land for construction projects.
- Low level of awareness and participation of the public in the caring for the greenspace in the cities and towns.

Studies on GI attributes

(1) diversity, (2) naturalness, (3) connectivity, and (4) good management (e.g. facilities, maintenance, reinforcement) have strongest positive effects to urban residents' health and well-being.

(1) Diversity

Urban areas that comprise of different types of green space, greenery, size and the richness of landscape elements. The experience of different types of GI offer spaces and landscape features and more choices for urban residents.

Concern of research:

- Streets are greenspace that is rich in informal activities such as movable food stalls (e.g. in Cambodia, Indonesia, Malaysia) where most activities and social interaction take place.
- Various greenspace enhance experiential contacts in urban, allowing more informal activities and exploration, favourite places, and attachment [e.g. Noorazuan and Ruslan (2003); Symann (2009); Lilian et al. (2004); Gairola and Noresah (2010); Fraser (2002)]

Studies on GI attributes: diversity

Streets are greenspace that is rich in informal activities such as movable food stalls (e.g. in Cambodia, Indonesia, Malaysia) where most activities and social interaction take place.

Hence, does design of the public spaces encourage people's movement?



In Cambodia, streets and sidewalks are vital because daily activities most often take place in the public spaces (Symann, 2009).

Studies on GI attributes: natural quality

- Highly natural urban environment consisting of vegetation, water bodies and other landscape features
- Vegetation and natural scenes such as water are the attributes of visual amenity that residents often value.

Concern of research:

- As part of ecosystem services to residents' well-being and sustainability of ecosystems.
- The significance of greenspace to user's visual aesthetic, preference and experiential contacts with natural scenes.
- Human interactions with greenery and natural features restore from stress and produces positive well-being effects.

Studies on GI attributes: naturalness quality



Studies on GI attributes

Connectivity: connectivity

- Opportunity for movement, physically and visually and wayfinding and orientation.
- Legibility is GI that is distinctive and ordered in an urban environment.
- Physical accessibility is the ability to move through an urban environment with ease and visual accessibility is the ability to see as residents experience the urban environment.



Studies on GI attributes

Concern of research:

- Connectivity counters fragmentation and enables continuity of wildlife habitats, greenspace and greenery.
- Nearby nature and wayfinding allow outdoor experiences e.g. for play activities and social cohesion.
- Physical and visual connections to spaces enable unbroken continuity of experience; allow wayfinding and orientation.

E.g. In Putrajaya, public buildings' GI is vital because it is a green node as well as a landmark that offers livability, aesthetic quality and preserving the greenery, thus improves environmental health mentally and physically for a community.

Studies on GI attributes: Naturalness Quality

E.g. the idea of garden city planning is suitable whereby naturalness quality become the essence of a city. This concept has been adopted to cities in Malaysia such as Petaling Jaya and Putrajaya.



Putrajaya's the Garden city concept (Siong, 2006)



Putra square, Putrajaya

Studies on GI attributes: good management

- Places that are well-designed and cared for make residents feel safer and they tend to use the spaces more.
- Management of greenspace (such as cleanliness of GI, ample facilities and good reinforcement) is vital for any country to ensure good quality GI is provided to users and in turn to be used properly.
- Framework on the urban landscape management
- Unused, derelict and decay and unsafe place need more attention.
- Nonetheless, many studies found that this is the most difficult aspect to accomplish because it deals with interrelated issues such as lack of manpower, budget, skill, knowledge, expertise, interest, awareness and sense of civic mindedness.

Conclusion

- Southeast Asian cities need to increase their provision of green infrastructure in order to achieve environmental sustainability.
- GI contributes to urban residents' recreational and social needs. Greenspace is free and available to all residents regardless of their gender, age, social and economic backgrounds.
- Governments of the region must consider urban residents' health derived from green infrastructure to be of important resources for future urban sustainability.



Research potential areas

- Adequacy of green space per capita and avoid urban environmental degradation
- Explore the results and contributions of the existing 'greening' strategy in by cities
- Guidelines to establish green infrastructure in sustainable way
- Community's attitude towards conservation of greenspace.
- Vertical greenery

Terima Kasih

He who plants a tree
Plants a hope.
~Lucy Larcom