

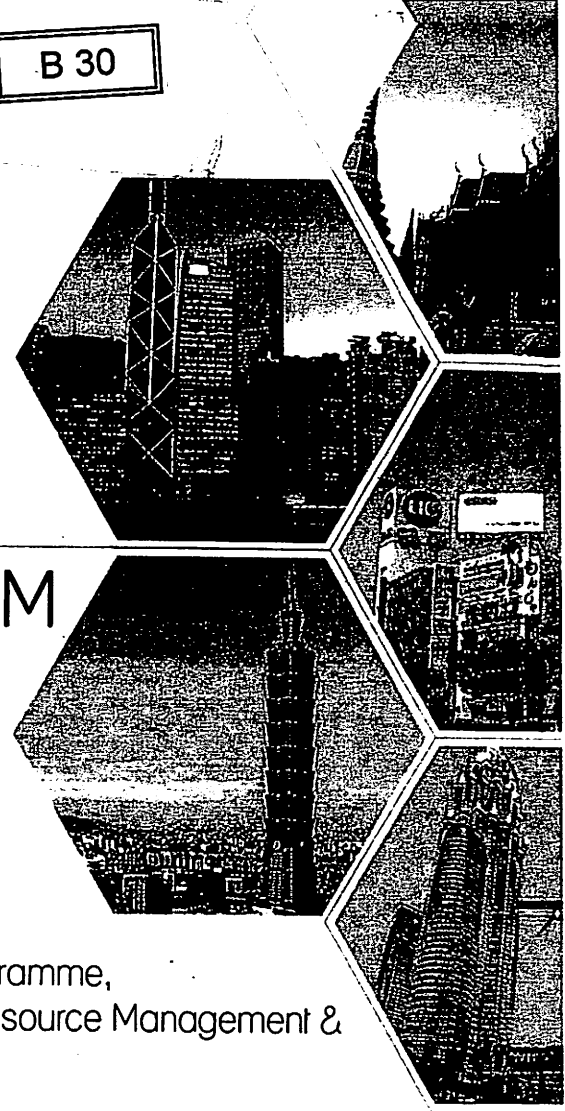
B 30

INTER-UNIVERSITY
SEMINAR ON
ASIAN MEGACITIES

ASIAN URBANISM AND BEYOND

15-17 August 2013

Organised by Urban Studies Programme,
Department of Geography and Resource Management &
Faculty of Social Science



Organisers

城市研究課程
URBAN STUDIES
PROGRAMME

GEOGRAPHY
RESOURCE
MANAGEMENT
地理與資源管理學系

社會科學院
Faculty of Social Science

Co-Organisers



亞太
HKU
AS



M.SC. (URBAN DESIGN) x CUHK

INSTITUTE OF FUTURE CITIES
THE CHINESE UNIVERSITY OF HONG KONG



傳承·開
Embrace our Culture
Empower our Future

Environmental issues are not easily addressed personally, but desperately needs the cooperation and commitment of the citizens of the community. It continues to occur in the vicinity of human life that requires awareness, activity integrated in the management of the environment, and population.

Human life cannot be separated from their surroundings, both the natural environment and the social environment. We need breathing air from the surrounding environment. We eat, drink, and our health, all of which require environment. Understanding the environment as everything that exists around humans which influenced the development of human life either directly or indirectly, according to the environmentalists, can be distinguished as biotic and abiotic. If we are in school, the biotic environment areschool friends, teachers,the employees, and all those who are stay in the school, as well as various types of plants which planted in the school and the animals in the surrounding areas. As for the abiotic environment components could be defined as air, desk chairs, blackboard, school buildings, and a variety of inanimate objects around.

The environment that consists of a fellow human being is referred as the social environment which constitutes the system in shaping one's personality. Specifically, people use the term environment to mention everything that affect the survival of all creatures in earth. Based on UU No. 23 of 1997, environment is the united spaces with all the objects of living beings including humans and behavior that accommodate humanity and human welfare as well as other living beings.

Human behavior has changed the environment. Environmental issues keep happening around us which either deliberately or accidentally caused by human actions. The following are a few examples of environmental damages as the result from a natural process settlement, such as building damaged by rain, earthquake, or tsunami. On the other hand, example of environmental damage that resulting from human activity is the changed micro climate, the reduced regional water absorption area caused by urban development, and the environment pollution that happened when there is a human environment pollutant in great quantity produced by human activities.

Global warming is happened due to human behavior. Following are the signs of the happening of global warming¹:

- According to the available data, global warming has increased the intensity of precipitation events over recent decades.
- From 1998 to 2002, below-normal precipitation and high temperatures resulted in droughts covering wide swaths of North America, southern Europe, and southern and central Asia.

**Designing Therapeutic Landscape as an Effort to Reduce Stress
Especially in School Environment Responding to Global Warming
Effect**

Setyawan, Siti Luzviminda H. P., M.T
Magister of Architecture
Bandung Institute of Technology
Jalan Ganesha 10 Bandung,
West Java, 40132, Indonesia
+62-899-513-7581
luzviminda.setyawan@yahoo.com

Dwiningrum, Siti Irene Astuti, Dr
Faculty of Education
Yogyakarta State University
Jl. Colombo, Karang Malang,
Yogyakarta. 55281, Indonesia
+62-815-687-6626
ireneast@yahoo.com

Abstract

There are several effects caused by the happening of global warming, in which one of the micro effect is the unbalance of the ecosystem, that generally causing several changes in people behavior, such as anarchy behavior, deviant behavior, and stress. In respond to the effect, which is happened because of the changes in the environment, there should be an improvement in the environment itself. The purpose of the improvement is not only to rebalance the ecosystem, but also as an effort to environmental preservation. One effort to do the improvement is by redesigning the landscape as the part of the environment. School is one kind of environment in need of stress reduction effort, as children nowadays, because of the changes in their environment, are easier to have behavioral changes. The approach of the research is to counteract the changes of behavior with landscape design as part of therapeutic environment, which could support in reducing stress, improving enthusiasm for learning, and creating a better environment for teaching-learning activities. The effort of reducing stress is also necessary to be conducted in the global context. It should be implemented in the areas that have a high influence of global warming which could be conducted in few districts related.

Keywords: global warming, school environment, behavioral changes, reducing stress, therapeutic landscape

Introduction

Human life is highly dependent on the quality of the environment while the well-being of human life is determined by its environment support. However, environmental issues continue to occur and it has started to become a global problem.

- Drought, heat, and insect attacks promote severe forest fires. All told, over the past 30 years, the area burned annually by wildfires in the Arctic region of western North America has doubled.
- Sea-level rise is one of the most certain impacts of global warming.
- During the 20th century, sea levels around the world raised by an average of 4 to 8 inches (10 to 20 cm), ten times the average rate over the last 3,000 years. That rise is projected to continue or accelerate further, with possible catastrophic increases of many meters if the ice sheets on Greenland and/or Antarctica collapse.
- Over the past 50 years, spring snowpack has diminished by 16% in the Rocky Mountains and 29% in the Cascade Range, due mainly to rising temperatures.
- In almost every mountainous region across the world, glaciers are retreating in response to the warming climate.
- The shrinkage of glaciers is already creating water shortages, and threatening tourism in scenic parks. In one basin in Glacier National Park in Montana, for instance, two-thirds of the ice has disappeared since 1850; with uncontrolled warming, the remaining glaciers could disappear by 2030.

The effect of global warming that affected the most of people's life is the occurrence of climate change. Climate change is described as a broader term that refers to a long term changes in climate, including average temperature and precipitation. The phenomenon of climate change has affected the dynamics of human life. Human behavior is changed in all its activities, for example in family, school, employment, hospitals etc. It is changed due to the change of elements that formed the human living environment, such as the change in the biotic environment, environmental abiotic constraints, and socio-cultural environment as the after effects of global warming. The efforts to create an environment that gives positive effects to human life must be creative and innovative which systemically designed, resulting in more optimal results in changing human behavior that tends to turn into stress.

Discussion

A. Stress and Behavior Changes

Human behavior changes as a result of climate anomalies which tend to caused stress. Children and teens notice and react to stress in their family and also experience their own stress. Generally, anything that may cause children fear and anxiety can cause stress. The following are some common signs of stress in different age groups (Table 1). The phenomenon of stress continues to increase due to changes in the ecosystem. The elements in the environment tend to no longer intact, it is

the interruptions in the process of interactions between elements of the environment are increasingly critical, no wonder there are areas that are no longer able to give strong environmental support resources for the needs of human life. As a result, the quality of the environment is declining, and the welfare of human life is getting low.

Table 1. Signs of Stress in Children and Teens

PRESCHOOL & TODDLERS	ELEMENTARY-AGE	PRETEENS & TEENS
<ul style="list-style-type: none"> • anger • anxiety • eating and sleeping problems, including nightmares • fear of being alone • irritability • regressing to infant behaviors • trembling with fright • uncontrollable crying • withdrawal 	<ul style="list-style-type: none"> • being distrustful • complaining of headaches or stomach aches • feeling unloved • having no appetite • having trouble sleeping • needing to urinate frequently • not caring about school or friendship • acting withdrawn • worrying about the future 	<ul style="list-style-type: none"> • anger • disillusionment • distrust of the world • low self-esteem • stomach aches and headaches • rebellion

Source: <http://www.healthlinkbc.ca/kb/content/special/ug1832.html> (June, 2013)

School environment is one environment in the need of rearrangement, so that the learning process can be run more optimally. The school environment should be maintained in order to provide a positive climate effect in shaping the behavior of students. If the school environment is not conducive, the students will have difficulty in learning, which resulting in the failure in building a culture of learning. There are few innovations regarding to learning environments for student in school, with a few changes in class environment design, based on research, could result in more positive student attitudes and greater participation in class (Gump, 1984; Rivlin and Wolfe, 1985; Sommer and Olsen, 1980).

Currently, problems at school keep going as it does: students learning, students are not lazy achievers, students quickly saturated, students easily conflict and a brawl, students are not creative. The phenomenon occurs because the climate of the school physically and socially no longer felt conducive to learn. Designing a school environment that is fun for the students to learn is a necessary.

B. Creating a Suitable Learning Environment

should designate a special place to study. This place should be uncluttered and should provide few distractions to allow for maximum concentration². One way to create a suitable learning environment is by creating a soothing environment. Creating a soothing environment can reduce stress and help to learn. Aromatherapy, for example, is a known stress reliever. Playing classical music can also be soothing and helping to learn, unless it was distracting. Following is more on finding a suitable learning space³.

The first step towards effective studying is to create a learning environment that fosters productivity. An ideal learning environment varies from person to person, but considering these five factors will help you to create your suitable learning environment⁴:

- Location

By choosing an appropriate location to work that would be the most comfortable location for studying.

- Atmosphere

There are few types of studying atmosphere that could be different from one person to another. Following are factors to consider choosing an atmosphere to study:

- Noise – some students prefer complete quiet, while others like soft background music or ambient noise.
- Lighting – harsh bright light is often unpleasant, while soft, ambient light can put you to sleep.
- Temperature – to find a place with a fairly consistent temperature.

- Private vs. Group Studying

If students prefer to study with a group of people, some factors that will need to be considered are location, planning, time of day, and the assignment. Just make sure that they are not distracting each other and that they are effectively working together to complete the assignment with minimal distractions.

- Distractions

Students may need to deal with some distractions to create an environment that allows them to be focused and productive:

- reduce noise distractions,

²<http://www.ctl.ua.edu/ctlstudyaid/studyskillsflyers/generaltips/creatingstudyenvironment.htm> (June, 2013)

³<http://stress.about.com/od/studentstress/ht/schoolstress.htm> (June, 2013)

⁴<http://www.wcu.edu/academics/campus-academic-resources/writing-and-learning-commons-walc/course-tutoring->

- keep the study environment uncluttered,
- once a student found a study environment that works well, use it regularly.

C. The Design Development Concept

Establish a quality environment of human life at the school was not easy, because it determined the ability to meet human needs. In general, Otto Soemarwoto (1989) regulate the quality of human life as something that satisfy the biological needs of living things such as water and air, satisfy the needs of human life such as housing, clothing, education, and health and satisfy the freedom which is restricted by both the written law by government and social norm. In the context of the school environment to meet environmental quality is determined by the adequacy of supporting elements of the environment to meet the needs of the school.

Social environmental design is basically planned to rebuild the dynamics of environmental elements to engineer more balanced in the environment as long with the existence of elements of biodiversity that consists of living beings, like humans, animals, plants, and microorganism. If we are in the schools, then the living environment is dominated by plants, while in the classroom, the living environment is predominantly by friends or fellow student. The case of socio-cultural elements, named the social and cultural environment, which made human as a system of values, ideas, and beliefs in behavior as social beings. People's lives can be achieved thanks to the regularity of any system of values and norms that are recognized and adhered by all members of the community. While the elements of the physical (abiotic component), as the elements of the environment which consisting of the inanimate objects, such as land, water, air, climate, etc. The existence of the physical environment is a huge role for the survival of living being on Earth.

The concept developed in the design of therapeutic environment at school includes variety of environmental factors, such as:

- Type and quantity of each type of environmental elements, for example is the number of elements of the plant,
- Interaction between the elements in the environment,
- Behavior or condition of the environment, for example, environment of a city which has active and hardworking inhabitants is different with similar city but with relaxed and lazy inhabitants. The other example, an environment of a region with gentle slope and fertile land is a different from a region with erosion and steep slope,
- Non-material temperature, light and noise, for example, an environment with heat,

Humans interact with the environment. They are affected and influenced by their environment.

The basic concept that was developed from therapeutic environmental design is to create an environment with a focus on improving the conditions of environmental factors, which are able to provide a positive effect for the improvement of environmental quality. With the improvement of the quality of the school environment, it is expected to reduce stress in students learning in the school.

D. Definition of Therapeutic Landscape

According to Roger S. Ulrich, a healing garden refers to the various features of the parks that have in common to encourage recovery from stress. In addition, Eckerling (1996) also has a definition that is not much different. A healing garden is a garden that was designed with the goal to make its users feel better. Following is the design criteria that was analyzed from Landscape Architectural Graphic Standards (2007).

Restorative Garden

A restorative garden is a garden that helps reduce stress and balance emotion with cognitive. It includes four phases of the therapeutic process as follows (Table 2):

1. The Journey

- Invite visual and physical exploration with various materials and vegetation,
- Emphasize transitions with hidden vistas which is making transitions with different views,
- Provide changing orientations with orientation to vegetation area and orientation to the water pond,
- Create thresholds of different microclimates with various spots; windy area, cool area, sunlight exposed area, shady area, grass area, etc.,
- Use combination of light and shadow with providing both vegetation with high and low density canopy and providing shady seating area,
- Providing chances for individual to shift from a painful or unproductive perspective with experiencing natural environment.

2. Sensory Awakening

- Supply a variety of noninvasive sensory stimuli and opportunities to stop and enjoy the sensations; providing visual stimuli with vegetation in various shapes, types, and colors; providing hearing stimuli with moving water sensation; providing smell stimuli with aromatherapy; and providing tactile stimuli with various textures of vegetation and materials.
- Call particular attention to fragrances and wind with choosing particular

- Bring awareness into the moment with choosing particular vegetation that changing through every season.

3. Self Awareness

- Apply the concepts of prospect refuge, auditory screening, and other protective measure to create physically and psychologically safe area for reflection and cathartic release that could be conducted by choosing particular vegetation and managing how to place it accordingly.
- Add small-scale social seating for interactions that can support enhanced self-realizations with providing scattered seating places in the park with various number of seating group.

Table II. Features of Restorative Garden

Features	<i>JOURNEY</i>	<i>SENSORY</i>	<i>SELF</i>	<i>SPIRIT</i>
View of plants from inside	■	■		
Verdant surrounding	■	■	■	■
Moving water (loud)	■	■		■
Moving water (soft)	■	■		■
Reflective water		■		■
Crossing bridges	■			■
Changing microclimate	■	■		■
Changing vistas/sounds	■	■		
Thresholds (constricted nodes)	■		■	
Fragrance	■	■		■
Non-threatening wildlife	■	■		■
Seasonal changes	■	■		■
Auditory stimulus	■	■		■
Physical challenge	■		■	
Cultural memories	■		■	■
Ephemeral		■		■
Celestial		■		■
Religious Icons			■	■
Safe resting places			■	■
Private space			■	■
Social space	■		■	

4. *Spiritual Attunement*

- Incorporate a sense of preciousness with giving chances to choose what kind of activity in what part of the garden based on user necessity and preference.
- Making connection with other species (non- threatening wild species, other than birds) which is interaction with butterflies.

Enabling garden

Enabling garden is a garden that assists in the process of restoration of the physical and cognitive ability through positive interaction with plants with the purpose to maximize physical function by adding social and psychological abilities. A little bit different with restorative garden, enabling garden would be more effective designed for special schools.

Enabling garden design is providing three levels of engagement; activities, opportunities, and challenges. Following is what activities levels providing:

- Enhancement of physical abilities with providing physiotherapy program and designing exercise path,
- Providing gardening and socializing in nature experiences,
- Supplying sensory exploration in which providing visual stimuli with vegetation in various shapes, types, and colors; providing hearing stimuli with moving water sensation; providing smell stimuli with aromatherapy; and providing tactile stimuli with various textures of vegetation and materials,
- Giving a sense of task completion when doing rehabilitation in the garden,
- Giving chances for interaction with others and working together supported by the design of seating area as part of social therapy,
- Giving the sense of reward of harvesting vegetables, herbs, and flowers as part of gardening program in physical and occupational therapy.

Even though it would be more effective designed in special schools, but it is also applicable in regular school with adapted principles.

For designing a therapeutic landscape, there are few guidelines that could be followed, as following:

- Have variety types of space, so that the user has the opportunity to choose, for example, between space with privacy or groups.
- Dominance of green material by minimizing land pavement until 2/3 of the land is dominated by green fields
- Providing positive distractions with the activity of gardening and working with plants, flowers, and which accompanied by the sound of water, could reduce stress;