SESSION DESCRIPTION

D1 Resilient Building and Construction Forum

Green infrastructure solutions for climate change adaptation

Presentations

Date: Friday, May 30, 2014
Time: 11:00-12:30
Rooms: S01-02

Language: English
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Organized by: ICLEI

OBJECTIVE

Green infrastructure (GI) refers to open, vegetated spaces and networks, both natural and designed, in urban areas. GI is increasingly applied as a no-regrets, ecosystem based measure for climate adaptation. By providing ecosystem services such as water storage, evapotranspiration, and coastal buffer zones, it defends against heavy rainfall events, rising temperatures, and sea level rise. GI is also a valuable community resource, enhancing air and water quality, biodiversity, aesthetics, recreational opportunities, and property values.

A series of presentations will analyze the benefits of green versus gray infrastructure and expand upon its application with case studies from Japan, the United States, and Colombia. The session will open with an examination of GI use trends in the United States, which were found to center on water management, and a presentation of a successful city-wide strategy to implement green infrastructure in Japan, illustrating actions needed by a local government. Continuing with the example of Japan, a study on the use of GI for controlling runoff during heavy rainfall events in Tokyo will be presented. The advantages and disadvantages of GI compared with conventional measures will be discussed. Strategies for identifying sites to implement integrated interventions will be addressed in the second half of the session. First, an analysis of land surface areas in Boston will demonstrate how cities can identify suitable spaces for GI and create regional GI networks. Lastly, a new framework from Barranquilla which exemplifies this process will be shared. The framework uses a multi-criteria analysis to select sites for scalable GI interventions. The various steps will be outlined along with the benefits of open green space for affordable, ecosystem based adaptation in cities.

OUTCOMES

- Participants will learn about the various benefits of green infrastructure in urban areas;
- Through the case studies, they will see how green infrastructure can be effectively applied to enhance urban resilience, ecosystems, and quality of life; and
- They will be able to take this knowledge with them to apply in their own cities and regions.

METHODOLOGY

- The facilitator will provide an overall introduction to the session topic and contributors. **(5 minutes)**
- Each presentation will be allotted 10 minutes. **(4 x 10 minutes)**
- The facilitator will manage questions and answers. **(40 minutes)**
- Closing remarks by the facilitator. **(5 minutes)**

CONTRIBUTORS

Facilitator *Lykke Leonardsen, Head of Climate Section, City of Copenhagen, Denmark*

Presenter *Sadahisa Kato, Research Associate, United Nations University (UNU-IAS), Tokyo, Japan*

Green infrastructure use trends in the USA and a successful city-wide implementation strategy in Nagoya, Japan

Green infrastructure provides multiple benefits in cities around the world. First, a review of its accelerating use in North America will be shared. The findings showed that GI is predominantly applied to water systems, and especially to stormwater management in the United States. Furthermore, GI has proven a cost-effective way to control runoff, supplementing conventional gray infrastructure. A Japanese case study will then be introduced: Nagoya City's 2050 Water Cycle Recovery Action Plan. The plan is one of the most comprehensive action plans at the city scale in Japan, illustrating key actions needed by a local government to successfully implement green infrastructure.

Presenters *Kazunori Tanji, Assistant Professor, Keio University, Fujisawa, Japan*

Hayato Shinno, Research Associate, Keio University, Fujisawa, Japan

Evaluating the effectiveness of green infrastructure to control flooding in Tokyo, Japan

In response to more frequent heavy rainfall events, the Tokyo Metropolitan Government has established a basic plan to control runoff through the use of porous pavement, seepage pits, and infiltration trenches. A study was conducted to determine the effectiveness of green infrastructure compared with these measures. A flood-prone residential area and a growing business district were selected for hydrological analysis. The results of the study will be discussed, including the relative advantages and disadvantages of employing green infrastructure. The study found that GI was less cost-effective than conventional measures, but offered additional long term co-benefits.

Presenter *Yaser Abunnasr, Assistant Professor, American University of Beirut, Lebanon*

Analyzing potential surface areas across land use types for an integrated GI network in Boston, USA

Effective green infrastructure systems require the allocation of extensive and

appropriate land surface areas not readily available in cities. A study of the Boston Metropolitan Area (MBA) will be presented which characterizes the MBA into gradient zones of pervious surfaces using high resolution GIS data and a percent pervious metric. The results compare the amount of surface area available across land use types for GI and the morphology of these spaces. The presentation will conclude with a strategy for developing an integrated and hierarchal green infrastructure network across the regional scale.

Presenters *Juan Carlos Vargas, Principal, GeoAdaptive LLC, Boston, USA*

Brittany Meece, Risk and Resilience Analyst, GeoAdaptive LLC, Boston, USA

A framework for using open green spaces for climate change adaptation and resilience in Barranquilla, Colombia

This presentation will demonstrate how open green space offers local governments the opportunity to implement low cost, highly effective climate adaptation strategies. A framework was developed in Barranquilla, Colombia to identify sites for new or retrofit open green space. Inventories of existing open space and best practices were first created. Site selection criteria were then developed including amount of stormwater runoff, permeability, public support, vulnerability, and capacity for multiple interventions. These were mapped using GIS to select sites for scalable, multifunctional interventions to exemplify potential strategies for climate change adaptation within the city, through the use of green infrastructure.