Part ONE

Water-related challenges

- Flooding
- Urban Heat Islands
- Water Scarcity
- Wastewater disposal and treatment

Megatrends in cities

- Water use & water scarcity
  Water withdrawals have tripled over the last 50 years. In 2030, there will be a 40% supply shortage of water.

- Sanitation
  Currently, 2.5 billion people are without improved sanitation facilities.

- Human health
  Currently, 3.4 million people mostly children – die from borne diseases every year.

- Hazards
  Water-related hazards a for 90% all natural hazards.

Widespread Flooding in China, 2016

- Cars are inundated in flood water in Wuhan, Central China’s Hubei province in July
- A soldier carries a sandbag to reinforce the dyke of Baidang Lake in Anhui
- People reinforce a dyke in Nanjing, Jiangsu province
- Wuhan, a city of 10 million people in Hubei in dire need of efforts to counter the risk of flooding

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2. Chinese Experiences of Sponge City
3. China-ASEAN Partnerships for Eco-Friendly Urban Development

Innovative Solutions for Urban Development in a Changing and Warming Climate

——Experiences and Cases from China

By Li Panwen
China-ASEAN Environmental Cooperation Center
Water as a resource is irreplaceable. Yet heavy rainfall can make it a disaster even in modern cities if rainwater is not drained on time. This was recently evident in Shanghai, Nanjing and other cities, especially in southern China, where streets more like the canals of Venice were submerged.

An estimated 32 million people across 26 provinces were affected and more than 300 people were killed. 280,000 hectares of cropland was destroyed, with state damage estimates of around US$5.73 billion. The damage estimate has reached US$22 billion. Flooding of this magnitude was last seen in the country in 1998.

Wuhan saw 570 millimeter of rainfall during the first week of July, surpassing the record that fell on the city in 1991. A red alert for heavy rainfall was issued on 2 July. At least 27 people were killed in the province and 400,000 required evacuation. Flooding encompassed 500,000 hectares of crops, 15,000 homes suffered major damage, and economic losses reached ¥5.7 billion (US$850 million).

Flooding causes more economic and humanitarian damage than any other natural disaster and has affected 2.3 billion people over the past five years. China has been particularly affected. The worst floods since 1998 hit the country in July 2016, with 150 were killed in central and northeast China after intense rainfall.

In China the climate is bringing more rain in summer. From June to July there will be high density rainfall. There’s already been very serious flooding for four or five years in a row, and you will see flooding in more cities. As urbanization increases, more people move to those cities that become more urbanized, and more people are affected. It results in floods in cities with outdated sewer systems. 79 people died in a rainstorm on July 21, 2012.

Part Two

International Concepts about Sustainable Urban Development

- Low Impact Development (LID) – USA
- Sustainable Urban Drainage Systems (SUDS) – UK
- Water Sensitive Urban Design – Australia
- Low Impact Urban Design and Development (LIUDD) – New Zealand
- Best Storm Water Management Practices (BMP) – USA
- Sponge City – China

Definition of Sponge City

A Sponge City refers to a type of city where water is absorbed by the ground and filtered naturally through permeable surfaces such as green areas, wetlands, lakes, gardens, etc. The water is able to be absorbed by the ground, which naturally filters the water. The naturally purified water can then be re-extracted and reused through natural or artificial wells within the city.
Background

In 2013, President Xi Jinping announced a national plan to address flooding in China’s cities—home to 450 million people. The plan mandates that, during the upgrade of urban drainage infrastructure, cities should make it a priority to retain valuable water resources and to work with the natural system to achieve drainage, to establish natural infiltration and natural purification—like a sponge.

Relevant Policies issued on Sponge City

- 2013: Chinese president Xi Jinping suggested cities “should be like sponges”
- 2014: Ministry of housing and urban-rural development: Guidelines for the Sponge City (Low-Development)
- 2015: Ministry of housing and urban-rural development, Ministry of Finance, Ministry of Water Resources selected 16 cities as the first batch of pilot cities.
- 2015: Ministry of housing and urban-rural development, The performance of sponge City Construction Evaluation and evaluation index
- 2015: Promoting Sponge City Construction (State Council)
- 2016: Each pilot city should submit a draft Specialized Planning before October, 2016.
- 2016: Second batch of pilot cities (14 cities)

Pilot Cities

6 cities were selected as China’s “sponge cities” in 2016, but eventually it will roll out nationally. There are 16 pilot cities as the second batch. The central government, local government and the sector. The central government is giving each city one year for the first round. In return, 20% of the pilot cities must be constructed ge city standard by 2020, by 2030. All of the pilot cities are to have completed the construction by 2017.

Methodology

City Design (Natural storm water infrastructure, storm water filtration, flood resilience, etc.)

- Baseline assessment
- Visioning, objectives, targets & indicators
- Scenario building & strategy development
- Development of an action plan & implementation
- Monitoring & evaluation

Six Components of Sponge City

- Permeate
- Detain
- Use
- Store
- Purify
- Drain

Benefits of Sponge City

- More clean water for the city
- Cleaner groundwater
- Reduction in flood risk
- Lower burdens on drainage systems
- Greener, healthier, enjoyable urban space
- Enriched biodiversity
sponge cities and the gies to support their rent such as for permeable concrete furtherments.

Sponge City Cases

Changde

Xiamen

Nanning

Chongqing

Changde

Rain Garden

Low Elevation Greenbelt

Permeable paving

Changde

Green Roof

Rain Garden

Low Elevation Greenbelt

Changde

Natural pond

Green Roof

Ecological Filter

Ecological Wetlands

Ecological riparian zone

Ecological floating island
Xiamen

After the "Xiamen Sponge City Constructio Technical Specifications (Trial)", another important document -- the "Xiamen Spong City Construction Management Interim Measures" (the Measures) has also bee promulgated. The Measures document set regulations for the management of the sponge city construction operation undertaken by the government and apply to the entire municipal area. Standard atlas guidelines, implementation specification and other relevant documents are yet to be completed, to comprehensively guide the development of the Xiamen sponge city.

Chongqing

Impately 800 million yuan invested in the construction of a pilot "sponge project in Yuelai New District. Investment will be used to eight roads and renovate the Chongqing international Expo and its surroundings, overs 400,000 square meters city with a unique of rainfall, the biggest ge for the project in Yulei strict is to find a tailor-way of constructing a city, according to Yang, ed that "the key to it is to lear of the characteristics ity’s rainfall.”
"Nanning Characteristics" Highlighted in Sponge City Construction

By April 2015, Nanning, with the kingdom achievements, was identified as the first batch of national pilot cities to act sponge city. Now, the construction had significant progress: the operating system and technical system for planned action have been set up, and on the land of parks, new water system led in to form a contiguous sponge body with Nanning characteristics. The present achievements aid a good foundation for Nanning’s goal of 70% of rainfall in 20% of the built-up area in 2020.

China-ASEAN Partnership for Eco-Friendly Urban Development

To tackle the issues related to urban development, especially the challenges related to climate change and sustainable development
To share the policies, regulations, methodologies for urban design
To scale up innovation, good examples and best practices among this region
To fuel up the implementation of SDGs

What We Need? Cooperation!

SDG 11: Make cities inclusive, safe, resilient and sustainable

China-ASEAN Partnership for Eco-Friendly Urban Development

Explore a China-ASEAN partnership for ecologically-friendly urban development, and jointly pursue green development.

8th ASEAN-China Summit, November 21st, 2015

Chinese Premier Mr. Li Keqiang

"Our Struggle for Global Sustainability will be won or lost in cities."
— Mr. Ban Ki-moon, UN Secretary General
Seminar on Cooperation under the China-ASEAN Partnership for Eco-Friendly Urban Development

12-13 December 2016, Shenzhen, China

Objective:

China-ASEAN Partnership for Eco-Friendly Urban Development

Areas of Cooperation

1. Organize China-ASEAN Eco-cities Summit
2. Conduct seminars and joint studies on management of urban ecosystems
3. Conduct capacity build activities on eco-city development
4. Cooperation on Low Carbon and Environmentally Sound Technologies (EST)
5. Promote national and regional green and sustainable development through the participation of governments, enterprises and society
6. Promote the building of a green “Belt and Road”

Areas of Cooperation

1. Conduct seminars on corporate social and environmental responsibility
2. Establish low carbon and EST cooperation network
3. Public Awareness and Participation
   - Promote public awareness
4. As the implementation body of the Partnership
   - provide the cities of China and ASEAN countries with a region-wide platform to carry out cooperation activities

Areas of Cooperation

1. Treatment and Recycling Use of Urban Waste
2. Building Green and Eco-friendly Communities
3. Mangrove Conservation and Management

Areas of Cooperation

1. International and Local Policies on Urban Ecosystem Conservation in China and ASEAN
2. Operation on Environmentally Sound & Low carbon Industries & Technologies
3. Cooperation on Ecosystem Conservation - Mangrove Conservation and Management

Areas of Cooperation

1. Policy and Experience Exchange on Development of Eco-cities
2. Conduct seminars and joint studies on management of urban ecosystems
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