

## Widespread Flooding in China, 2016



Students make their way across a flooded schoolyard in Wuhan in central China's Hubei province



Water as a resource is irreplaceable. Yet heavy rainfall can be a disaster even in modern cities if rainwater is not drained in time. This was recently evident in Shanghai, Nanjing and other cities, especially in southern China, where streets are more like the canals of Venice.

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 completely or sustained major damage, and economic losses reached ¥5.7 billion (US\$850 million).

## Urban Waterlogging in Beijing, 2012



Flooding often results in floods in cities with outdated sewer systems. 79 people died in Beijing after a rainstorm on July 21, 2012.

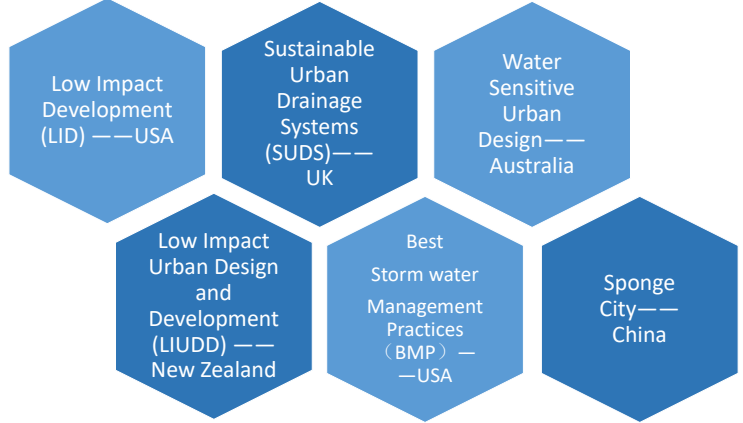


Flooding causes more economic and humanitarian damage than any other natural disaster and has affected 2.3 billion people over the past century. China has been particularly affected. This year saw the worst floods in the country since 1998. In July 150 people were killed in central and northern China after intense rainfall.

In China the climate is bringing more rain in summer. From June to September there will be high density rainfall. This is bringing up urban planning issues. There's already been very serious flooding for four or five years in the summer. You will see flooding in more and more cities. As urbanization continues, more people in those cities that become worse and worse.

# TWO Part

## International Concepts about Sustainable Urban Development



## Definition of Sponge City

Water

Resilience

Cities with a minimal impact on the natural water cycle are able to absorb and naturally filter storm water, fill urban aquifers and preserve healthy urban water resources.



## Definition of Sponge City



A Sponge City refers to a type of city which allows much of the storm water to be absorbed by the ground. Thanks to the vast amount of permeable surfaces across the city (green areas, wetland, 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

Attention paid by central government and local government

In September 2013 President Xi Jinping announced a national plan to combat flooding in China's cities— inhabited by 450 million people. He said that during the upgrade of urban drainage infrastructure they should make it a priority to retain valuable water resources and to return to the natural system to achieve drainage, to establish natural on, natural infiltration and natural purification – like a sponge



The sponge city programme takes inspiration from low impact development in the US, water sensitive urban design in Australia and sustainable drainage systems in the UK. But nothing at this scale has ever been attempted before. The sponge city programme is more comprehensive and ambitious.



# Benefits of Sponge City



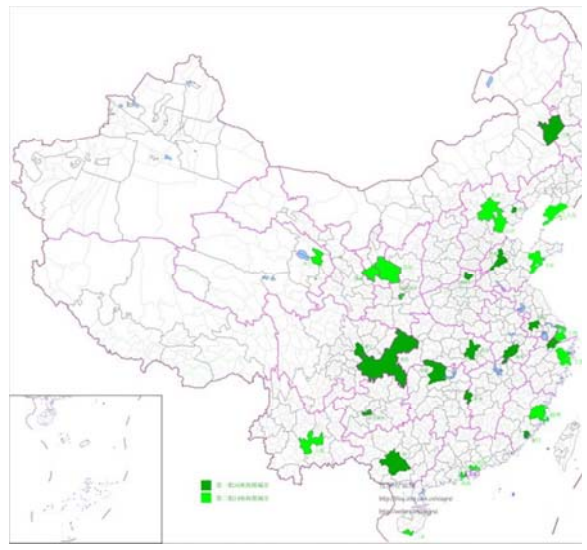
- More clean water for the city
- Cleaner groundwater
- Reduction in flood risk
- Lower burdens on drainage systems
- Greener, healthier, enjoyable urban space
- Enriched biodiversity

# Relevant Policies issued on Sponge City

- 2013 1. Chinese president Xi Jinping suggested cities “should be like sponges”
- 2014 2. Ministry of housing and urban-rural development: Guidelines for the Sponge City (Low-Development)
- 2015 3. Ministry of housing and urban-rural development, Ministry of Finance, Ministry of Water Resources selected 16 cities as the first batch of pilot city.
- 2015 4. Ministry of housing and urban-rural development, The performance of sponge City Construction Evaluation and evaluation index
- 2015 5. Promoting Sponge City Construction (State Council)
- 2016 6. Each pilot city should submit a draft Specialized Planning before October, 2016.
- 2016 7. Second batch of pilot cities (14 cities)

# Pilot Cities

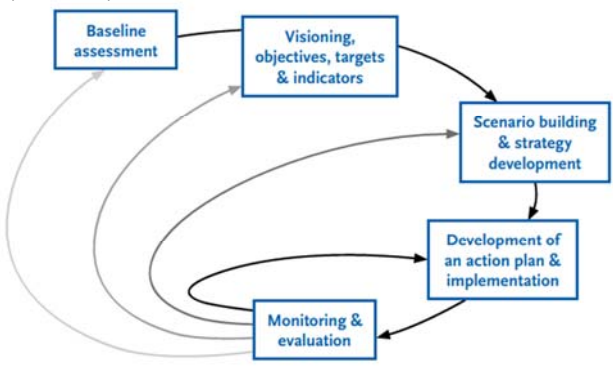
16 cities were selected as China's “sponge cities” in the first batch, but eventually it will roll out nationally. There are 14 cities as the second batch. The main focus of this ambitious project is being led by the central government, with support from local government and the private sector. The central government is giving each city 1 billion yuan a year for the first three years. In return, 20% of the cities must be constructed to meet the sponge city standard by 2020, by 2030. All of the pilot cities should have completed the construction by 2017.



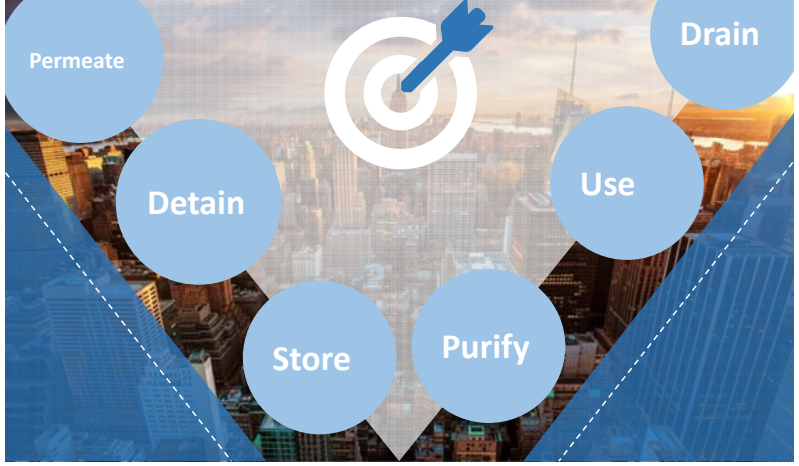
# Methodology

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

made roadmap for each city with a focus on win-win's



# Six Components of Sponge City



# Technology

sponge cities and the technologies to support their development such as permeable concrete further developments.



water permeable brick

# Sponge City Cases



Changde



Chongqing

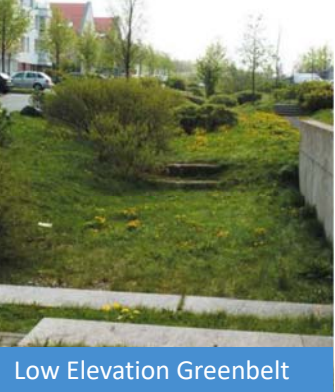


Xiamen

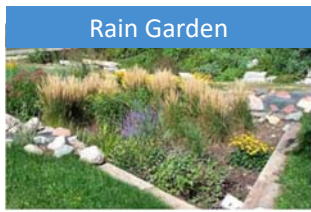


Nanning

# Changde



Low Elevation Greenbelt



Rain Garden



Permeable paving

Permeable

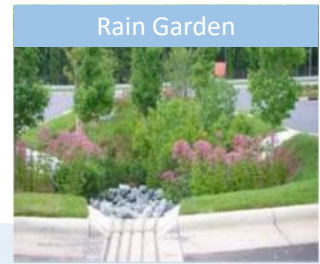
# Changde



Low Elevation Greenbelt



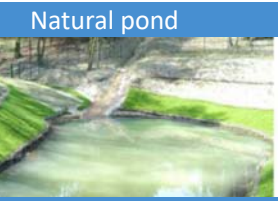
Green Roof



Rain Garden

Retention

# Changde



Natural pond



Green Roof



Round storm water collection tank



Outdoor storm water collection tank

Storage

# Changde



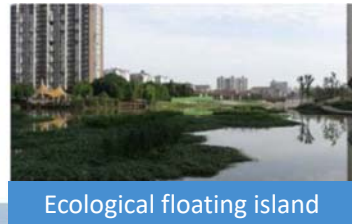
Ecological Filter



Ecological Wetlands



Ecological riparian zone



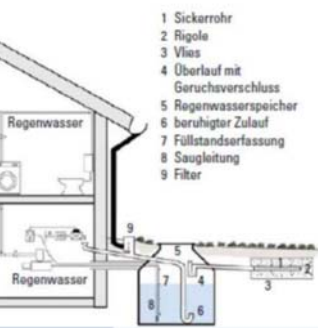
Ecological floating island

Purify

# Changde

water collection and re-use System (for toilet use)

Landscape Water



Use

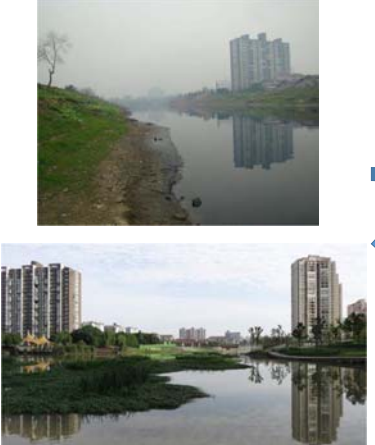
# Changde



Treated water into river

Draini

# Changde



# Changde



# Xiamen



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

# Chongqing

Approximately 800 million yuan has been invested in the construction of a pilot "sponge city" project in Yuelai New District, Chongqing. Investment will be used to construct eight roads and renovate surrounding international Expo and its surroundings, covering 400,000 square meters.

Mountain city with a unique topography, the biggest challenge for the project in Yuelai New District is to find a tailor-made way of constructing a sponge city, according to Yang. He stated that "the key to it is to learn from the characteristics of the city's rainfall."

A retention pond built in the Yuelai Convention and Exhibition Park is a vital component of the area's spongy city project



A rooftop garden installed at a residential district of the area can absorb 20 percent rainfalls. It can lower the temperature in surrounding area by about 2.0 centigrade, which has great implications to ease up the city's heat island effect.



An underwater garden during dry season is designed based on a desolate beach along the Yangtze River



# "Nanning Characteristics" Highlighted in Sponge City Construction

By April 2015, Nanning, with the significant achievements, was identified as the first batch of national pilot cities to construct sponge city. Now, the construction has gained significant progress: the operating mechanism and technical system for planned construction have been set up, and on the basis of the green land of parks, new water features have been led in to form a contiguous integrated sponge body with Nanning characteristics. The present achievements have laid a good foundation for Nanning's goal to absorb 70% of rainfall in 20% of the built-up area in 2020.



# THREE Part



## 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!



## China-ASEAN Partnership for Eco-Friendly Urban Development



"Our Struggle for Global Sustainability will be won or lost in cities."

— Mr. Ban Ki-moon, UN Secretary General

**11 SUSTAINABLE CITIES AND COMMUNITIES**

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

## China-ASEAN Partnership for Eco-Friendly Urban Development

8<sup>th</sup> ASEAN-China Summit, November 21<sup>st</sup>, 2015

Chinese Premier Mr. Li Keqiang

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



## Forum on China-ASEAN Partnership for Eco-Friendly Urban Development

17-18, November 2015 Beijing, China



**指导机构**  
Under the Auspices of

- 中国环境保护部  
Ministry of Environmental Protection of China
- 东盟秘书处  
ASEAN Secretariat

**主办机构**  
Organized by

- 中国-东盟环境保护合作中心  
China-ASEAN Environmental Cooperation Center
- 东盟生物多样性中心  
ASEAN Centre for Biodiversity

**合作伙伴**  
In Partnership with

- 新加坡国家公园委员会  
Singapore National Parks Board
- 联合国环境规划署  
United Nations Environment Programme
- 联合国生物多样性公约秘书处  
Secretariat of Convention on Biological Diversity
- ICLEI  
领导地区可持续发展国际理事会  
Local Governments for Sustainability-ICLEI

**Seminar on Cooperation under the China-ASEAN Partnership for Eco-Friendly Urban Development**

12-13 December 2016, Shenzhen, China

**International and Local Policies on Urban Ecosystem Conservation in China and ASEAN**

**Cooperation on Environmentally Sound & Low carbon Industries & Technologies**

**Area 1: Treatment and Recycling Use of Urban Waste**

**Area 2: Building Green and Eco-friendly Communities**

**Joint Cooperation on Ecosystem Conservation - Mangrove Conservation and Management**



**China-ASEAN Partnership for Eco-Friendly Urban Development Objectives**

 <p>Promote and mainstream green and sustainable development through exchange and cooperation of Eco-Cities.</p>	 <p>Enhance the capacity of urban environmental governance and eco-system management to support the development of ecologically friendly and livable cities in China and ASEAN; and</p>
 <p>Promote the building of a green "Belt and Road"</p>	 <p>Promote national and regional green and sustainable development through the participation of governments, enterprises and society.</p>


**China-ASEAN Partnership for Eco-Friendly Urban Development Areas of Cooperation**

 <p>Policy and Experience Exchange on Development of Eco-cities</p> <p><b>01</b></p>	<p><b>Organize China-ASEAN Eco-cities Summit</b></p> <hr/> <p><b>Conduct seminars and joint studies on management of urban ecosystems</b></p> <hr/> <p><b>Conduct capacity build activities on eco-city development</b></p>
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**China-ASEAN Partnership for Eco-Friendly Urban Development Areas of Cooperation**

 <p>Cooperation on Low Carbon and Environmentally Sound Technologies (EST)</p> <p><b>02</b></p>	<p><b>Conduct seminars on corporate social and environmental responsibility</b></p> <hr/> <p><b>Establish low carbon and EST cooperation network</b></p>
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**China-ASEAN Partnership for Eco-Friendly Urban Development Areas of Cooperation**

 <p>Public Awareness and Participation</p> <p><b>03</b></p>	<p><b>Conduct exchange activities on eco-community</b></p> <hr/> <p><b>Promote public awareness</b></p>
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**China-ASEAN Partnership for Eco-Friendly Urban Development Areas of Cooperation**

 <p>Establish China-ASEAN Eco-city Alliance</p> <p><b>04</b></p>	<p><b>As the implementation body of the Partnership</b></p> <hr/> <p><b>provide the cities of China and ASEAN countries with a region-wide platform to carry out cooperation activities</b></p>
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**Thanks.**

