



**WATCH & LEARN: SUSTAINABLE DEVELOPMENT
THE CLIMATE CRISIS: URBAN PLANNING
CHINA'S SPONGE CITIES (6:25 min)
VIDEO Script & Vocabulary (page 1 of 2/v32111)**

ADVANCED LEVEL (C1) AND ABOVE

- ◊ Read the script and note new vocabulary
- ◊ Write three sentences using new vocabulary
- ◊ Prepare for the discussion questions

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Although one city design certainly won't save us from the effects of climate change, "sponge cities" can help with how we live with it.

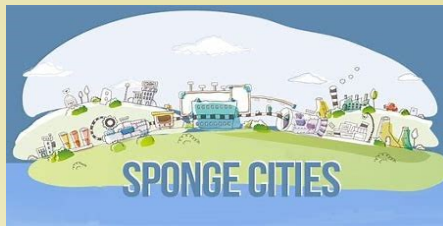
- 1 Read the **Video Script** below. The words in **bold** are defined in the **Vocabulary** section. Look up any new words in a dictionary.
- 2 Go to the **Your Turn** section at the end of this document. Practice using new words and expressions from the video script to prepare for your next class.
- 3 Look at the **Discussion Questions** and prepare your responses for the next class.

Discussion Questions:

- ◊ Are you concerned about the manner in which the increasing severity of natural disasters might impact life in your city?
- ◊ What are some of the methods cities can implement in order to mitigate these impacts?
- ◊ Have you ever heard of "sponge cities"?

Video Script:

Narrator: This isn't a forest. Not really. It's actually an urban park in the densely populated city of Nanchang, China. Filled with birds, native trees and volcanic rock on 137 **acres** of urban land. It's called a **sponge city**. And it's a type of natural infrastructure that architects around the world are designing to help us combat and **withstand** a changing climate. So what does it mean for a city to become spongy?



Today, like everywhere else on the globe, cities are feeling the effects of climate change. And they often don't have the right infrastructure to help them survive its impacts. Some neighborhoods in Houston don't have enough trees to provide shade and relief from rising temperatures. Meanwhile, rising sea levels threaten coastal cities, like Mumbai and Seoul that don't often have the infrastructure to handle more frequent flooding. This is only made worse by the fact that cities are covered with **pavement** and other surfaces that can't absorb water.

Dr. Charlie Nilon, Professor of Urban Ecology, University of Missouri: Urbanization changes habitat. So, when you build on a place it removes vegetation and alters hydrology.

Narrator: That's Dr. Charlie Nilon. He told me that cities play a complicated **role** in the climate crisis especially when it comes to maintaining **biodiversity**.

Dr. Nilon: Biodiversity is, simply put, the total number of plants and animals that occur someplace.

Narrator: Biodiversity is one of our main support systems for human life on earth. We rely on natural ecosystems full of diverse plants, animals, and organisms for essential things like clean water, food, and medicine. And biodiversity is **critical** to defending the Earth against climate change. We need healthy forests to absorb carbon dioxide from the air and enough native plants for **pollinators** to help crops **flourish**. But studies show that as urban expansion continues it can drive habitat losses that directly put some species in danger, profoundly impacting global biodiversity.

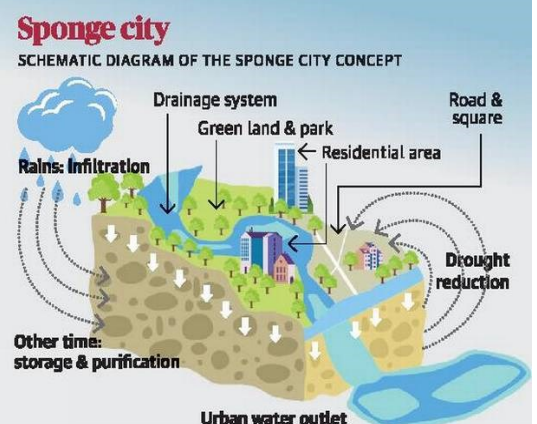
Dr. Nilon: Cities have a big impact on what happens locally. Cities capture a significant number of plant and animal species which are native. So that, even in cities, there's a significant amount of biodiversity.

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Vocabulary:

- **acre** - a unit of land area equal to 4,840 square yards (0.405 hectare)
- **sponge city** - an urban construction model designed to reduce damage from flooding
- **withstand** - remain undamaged or unaffected by; resist
- **pavement** - any paved area or surface; the hard surface of a road or street
- **role** - the function assumed or part played by a person or thing in a particular situation
- **biodiversity** - the variety of plant and animal life in the world or in a particular habitat, a high level of which is usually considered to be important and desirable
- **critical** - extremely important to the progress or success of something
- **pollinator** - an insect or other agent that conveys pollen to a plant and so allows fertilization
- **flourish** - grow or develop in a healthy or vigorous way, especially as the result of a particularly congenial environment

Vocabulary continued on next page...



Rather than using concrete to channel away rainwater, you work with nature to absorb, clean and use the water in a sponge city.



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Video Script continued...

Narrator: Which means they can play a role in saving these local plant and animal species.

Dr. Nilon: The really important thing to think about is not so much how urbanization reduces biodiversity, but really how in cities you can conserve biodiversity.

Narrator: One way to do this is by creating environments where nature can flourish. Environments that can also help cities **soak up** excess water. And that's where sponge cities come in. In 2015, China launched a sponge city **pilot program** in 30 cities across the country. The goal of the program was to coordinate and promote the construction of sponge cities, which would improve urban **drainage** and flood prevention and create a diverse biological environment.

Architects did this by supplementing the existing **grey infrastructure** that relied on concrete pipes and dams with natural solutions like gardens that are designed to capture rain and native trees that suck up excess water through their roots. In China, these ideas were taken from ancient drainage systems. That's because for centuries Chinese cities actually **handled** water pretty well in part because they were built with nature **in mind**.

A study from the scientific journal, *Water*, recreated some of these old practices. Building roofs designed with sloped eaves allowed rainwater to fall onto the **permeable** pavement below and exterior walls were lined with flowers and trees to absorb rain and stormwater. Today, natural solutions like these have been **reimplemented** in major cities across China.

In Qian'an, a **sewage pipe** was replaced with this natural infiltration system that uses vegetation beds to purify storm and rainwater. Shanghai replaced concrete roads and sidewalks with this permeable pavement which is lined with vegetation to absorb excess water into the soil underground. And across Wuhan, dozens of urban gardens like these were planted to absorb water before it **overwhelms** communities. Most of these projects rely on introducing vegetation in an urban area to soak up excess water. This is a really great way to handle flooding and it also supports urban biodiversity.

Dr. Nilon: Because you're providing habitat for additional groups, plant and animal species. Sometimes you can restore habitats that have been lost.

Narrator: Despite these benefits, sponge cities can't fix everything. The connection between climate change and flooding is still being studied. But when floods do happen, these spongy cities are only able to absorb excess water **up to a certain point**. In 2021, sponge city designs in Zhengzhou failed when historic rainfall drenched the city. More than 300 people died from the catastrophic flooding.

There are other limitations, too. One review of sponge cities in Guian New District found that national standards and codes for spongy infrastructure are really difficult to enforce because climate, hydrology, and even **socio-economics** are vastly different from one city to the next. So what might work in some cities won't necessarily solve climate-related problems in others. Plus, ambitious sponge city designs like the **sprawling** parks built in China are expensive and require a lot of space, which most cities don't have.

So some US cities experimenting with natural infrastructure like LA and Boston are using the green space they already have. By trying things like planting vegetation on curbs and creating green spaces along median strips. One type of city design certainly won't save us from climate change but they can make a difference in how we live with it.

Dr. Nilon: We often talk about biodiversity like it's far away, but it's actually right there. And I think the more that people understand that the kinds of things they do around where they live that really matters. People can do things to change cities.

Vocabulary continued...

- **soak up** - absorb a liquid
- **pilot program** - a small-scale preliminary study or project that is conducted to evaluate feasibility, duration, cost and other aspects of a larger research or implementation idea
- **drainage** - the action or process of letting out liquid from something
- **grey infrastructure** - engineered assets made of materials such as concrete and steel that provide one or multiple services required by society
- **handle** - manage (a situation or problem)
- **in mind** - in one's thoughts
- **permeable** - (of a material or membrane) allowing liquids or gases to pass through it
- **reimplemented** - implement again or differently
- **overwhelm** - bury or drown beneath a huge mass of something, especially water
- **up to a certain point** - to some extent but not completely
- **sprawling** - spreading out over a large area in an untidy or irregular way