

## Build sponge cities to easy urban hydro-climatic hazards

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Global population continues to rise, with a trend of moving into cities. In the meantime, global warming in accompanying with unprecedented hydro-climatic hazards prevails. Thus, disaster losses in cities are expected to increase unless man-made cities are transformed. The authors propose to change a city to a super sponge, i.e. a sponge city, with a capability of absorbing a significant amount of rainwater during each rainfall events and emitting out water vapor on sunny days. Most of all, with sufficient water and air underneath the surface, abundant microorganisms will flourish and ecological systems suitable for sunless wet-land can develop. The benefits are: negligible surface runoff leading to a minimized flooding probability, sufficient water storage for mitigating heat-island effect and providing needed water resources, ecological filtering of pollutants in stormwater, capturing and decomposing air pollutants and carbon dioxides emitted from moving vehicles by the underground wet-land, etc. The key point is to replace all man-made pavements with high-bearing high-permeable pavements build by the JW Ecotechnology invented by the first author (named as the JW pavement hereafter). The result is that every pavement still retains its original functions but water and air can go freely in and out the JW pavement. Such technique has been well-tested nearly a decade in Taiwan and is with low cost in construction and maintenance; hence is suitable for even underdeveloped countries. This article will focus on how urban hydro-climatic hazards can be minimized when cities are changed to be sponge cities.

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