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Establishing Vulnerability Map of Water Resources in Regional Water Supply System

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In recent years, the threat of increasing frequency of extreme weather rise up human attention on climate change. To reduce the threat of water scarcity, it is important to know how climate change might affect regional water resources and where the hotspots, the vulnerability points, are. However, there is not much information to help government understanding how climate change will affect the water resources locally. To a regional water supply system, there might be some hotspots more vulnerable to climate due to the lack of water treatment plants or tape water pipe system. And also, there might be some hotspots more vulnerable due to high population and high industrial product value when they expose to the same threat of water scarcity.
This study aims to evaluate the spatial vulnerability distribution of water resources and propose the adaptive plan for southern region of Taiwan. An integrated tool – TaiWAP (Taiwan Water Resources Assessment Program) for climate change vulnerability assessment on water resources, which includes 10 GCMs output of SRES A2, A1B, B2 scenarios, weather generator, GWLF model, and Analytic Hierarchy Process (AHP) tool is used for climate impact assessment. For the simulation of the complex water supply system, the system dynamics model- VENSIM which is connected with TaiWAP is adopted to simulate a water supply system and evaluate vulnerability of each unit in a water supply system. The vulnerable hotspots will be indicated in the system and the adaptive strategies will be applied to strengthen the local vulnerable area. The adaptive capacity will be enhanced to mitigate climate change impacts on water supply system locally to achieve sustainable water uses.