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Application of SWMM in Water Resources Management: A Community Scale Study

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Under the impacts of climate change, water resource management faces a serious challenge. Due to extremely events, the water supply system is hard to maintain stable water supply. In order to decrease the pressure of centralized water supply system, the water demand management should be strengthened. The storm water management model (SWMM) is widely used to simulate surface runoff, and it has been improved to have the ability of continuous simulation. In this study, storm water management model (SWMM) is applied to simulate surface runoff and integrated into the framework of water resource management for a rural community scale. In a rural community, the surface runoff may be collected and treated by wetlands for later uses. The reclaimed water from wetlands may become a new water resource for non-contact domestic water uses, or be reused to meet irrigating water demand. Thus, the water demand from the centralized system can be reduced, and the water supply system may have lower risk under the climate change. On the other hand, SWMM can simulate the measures of low impact development (LID), such as bio-retention cell, green roof, rain barrel etc. The decentralized measures, LID, may not only reduce the runoff and delay the peak flow, and but also provide the service of water supply. In this study, LID is applied to water resource management of a rural community, and combined with the centralized water supply system. The results show the application of SWMM to water resources management in a community scale study. Besides, the effectiveness of LID on water supply is also evaluated.