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Priority and construction sites of water storage in a watershed in response to climate change

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Taiwan is located at the Eastern Asia Monsoon climate zone. Typhoons and/or convectional rains occur frequently and result in high intensity storms in the summer season. Once the detention facilities are shortage or soil infiltration rate become worse in a watershed due to land use, surface runoff is easily to concentrate and threaten the protected areas. Therefore, it is very important to examine the functionality of water storage for a watershed. The purpose of this study is to solve the issue of flooding in the Puzi Creek. A case study of Yizen Bridge Watershed, in which the SCS curve number was used as an index to extract the spatial distribution of the strength of water storage, and the value of watershed mean CN along the main channel was calculated using area-weighting method. Therefore, the hotspot management sites were then derived and the priority method was applied to screen the depression sites for the reference of management authorities in detention ponds placement. The results show that the areas of subzone A with the characteristics of bad condition in topography and soil, which results in poor infiltration. However, the areas are mostly covered with forest and are difficult to create the artificial water storage facilities. Detention dams are strongly recommended at the site of depression in the river channel to decrease discharge velocity and reduce impact from flood disaster. The areas of subzone B are mainly located at the agriculture slope land. The topographic depressions in the farmland are the suitable places to construct the farm ponds for the use of flood detention and sediment deposition in the rainy seasons and irrigation in the dry seasons. Areas of subzone C are mainly occupied the gentle slope land with a better ability in water storage due to low CN value. Farm ponds constructed in the riparian to bypass the nearby river channel can create multifunctional wetland to effectively decrease the peak discharge in the downstream during storm events. Depression storages are based on additional runoff obtained from CN calculation. Strategies mentioned in this study can be provided as references of climate change adaptions for related authorities.