



Study on the river protection strategy of river with serious sediment deposition

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In the weak geology of catchment, the river deposition is often observed due to high sediment supply caused by rainfall-induced soil erosion. Taiwan is an island in the East Pacific Ocean, was characterized by frail geology and the abundant rainfall during flood season from June to October, so the sediment depositions were observed in the most rivers in Taiwan. But the rainfall duration and intensity were increased under climate change conditions in the past decade, the great sediment supply causing severe depositions in the upper and middle river reach. For example, the average deposition depth of 5.6m was measure in the upstream Zhuoshui River of Taiwan form 2010 to 2015. The serious sediment siltation also causes disasters including insufficient flow area, bank erosion, embankment failure, and house loss. Although the river bed has been dredging continuously in recent years, the improved efficiency in river safety is still limited because the amount of deposition is greatest than sediment removed. In this study, a protection strategy for the serious deposition of the river was proposed. The first one is the management part. That suggested that dividing the high-risk area of flood and bank erosion to disaster prevention zone and maintaining the current situation of river zone based on the elucidation of a map of river course change and the analysis result of the numerical movable bed model. The human activity in disaster prevention zone would be restricted for preserving people's safety in climate change. The second one is the technology part. That was located the high potential zone of sediment deposition by the unmanned aerial vehicle system (UAVs) and the survey results were used for the effective river dredging planning. Several data of river topography changes have been monitored by UAVs in 2011 - 2018. By the strategy of river management and technology application, current flood control and defense works would be comprehensive.