



## **Analysis of Sediment Deposition in Irrigation Pond in Southern Taiwan**

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Irrigation ponds are useful facilities for agriculture, especially in the mountain area where has very active farming. Due to the hill ponds are located in the mountain area and farming actives, the sediment deposited is always the issue. In this study, we used the erosion pins, USLE and MUSLE to evaluate the sediments yield, as well as the sonar sensor to get the pond bathymetric which compared with sediments yield. There are 5 hill-irrigation ponds in southern Taiwan selected to be observed for one year with different conditions which described as followed: (1) Pond A, the area is 2 hectares and located in mudstone region where the vegetation is poor. (2) Pond B, area is 2.3 hectares with a natural landform as a settling basin and located on a tributary of River Uren. (3) Pond C, area is 0.12 hectares with an artificial settling basin and located on a tributary of River Uren. (4) Pond D, area is 0.8 hectares and located in a well management site where is an agriculture research station. (5) Pond E, area is 0.05 hectares with a very small watershed (0.15 hectares).

The results show that (1) According the measurements of erosion pins, the erosion depths are increased with the hill slope when the total precipitation of rainfall event is less than 200mm and duration is less than 24 hours. (2) According the measurements of erosion pins, when the total precipitation of rainfall event is more than 500mm and duration is more than 48 hours, the erosion depths of hill slope between 25~45 degree are the minimum region which depths less than mild slope region (7.5~20 degree) and steep slope region (45~65 degree). That might be caused the soil in mild slope region was weaken by rainfall inundated, and the soil in steep slope region was moving down massively. (3) The erosion depths which evaluated by MUSLE were well underestimated than erosion pins and pond bathymetric method. (4) The erosion depths which evaluated by USLE were closer with erosion pins and pond bathymetric method. (5) Due to the soil particles of mudstone region were very fine which were the suspended load, therefore, the sediment-deposited distribution of Pond A was really uniform. (6) Even though Pond C was built with a settling basin, it still been filled by sediment after a rainfall events with 600mm rainfall. That shows pond located on a tributary and had a large watershed which would have higher probability to fill by sediments. (7) For a small watershed pond (Pond E), the variation of pond bathymetric were not significant after rainfall events scilicet rainfall is not the dominant factor for sediment deposited. (8) For a well management pond, the deposited situation would be contained.