

## **Abstract**

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Due to the increase in demand for sand in various chemical and manufacturing industries, sand mining from river channels has significantly increased. Moreover, the stable fluvial system can be altered by pit migration in the sand bed river channel, causing an abrupt change in the morphology and ecology of the river. In the present study, a flume (assuming a straight river channel) based analysis of sand-mining pit migration is performed. The study is conducted through experiments considering nine different cases. These cases are based on the variation of shape and size of the sand pit and inflow discharge. The bed profile is measured using a video game device - Kinect and a DSLR-camera. Tracking of the bed profile enables to track the evolution of the pit and its migration. The results of the Kinect are validated with the camera. Repeatability is performed to ensure the consistency of the experimental procedure. Measurements from the present study are validated against earlier experimental results reported in the literature. Based on the current observations, the rate of pit migration increases as the rate of discharge increases. The migration rate of the parabolic pit is less than that of the rectangular pit. The time of filling for the partial-width pits is less than that of full-width pits for identical inlet discharges. In case of whole width cylindrical pit, it takes more time to fill at the centre compared to the portion at the sides. Rate of migration of the centre point of the pit is faster as compared to the sides. More detailed experiments are required to apply the results for real-life cases.