Abstract

Bathymetric changes have been observed over the years in the Chokwè irriga-   tion scheme (CIS) and little is known about their cause. This study assessed bathymetric variations that have occurred since 2001, when the scheme was last rehabilitated. The bathymetry of canal beds and banks was analysed using GPS-Rover surveying equipment to determine cross-section and longitudinal profiles. Water level measurements were performed using staff gauges at nine different sampling stations. Data sets for 2001, 2016 and 2019 were considered. Canal depth changes were captured, and density plots generated. Bathymetric changes of cross-sectional and longitudinal profiles, slope trend analysis models, canal depth changes and water depth variation, were assessed. Results suggest cross-sectional and longitudinal bathymetric profiles are affected by sediment accumulation. The depths of canal beds varied from 0.5 to 2.0 m over a span of more than 80 km. Trend analysis models indicated good accuracy for fits in all three reaches in 2001, 2016 and 2019. The forecast accuracy predictors MAPE, MAD and MSD were all found to have minimal values within the acceptable range of 1 and 3 for all the years and sectors. The water depth in the canal showed considerable variation within and across each sampling point and station, varying from 3.5 to less than 1.2 m. These findings will play a significant role in the study of water flow and sedimentation processes in the CIS.