Abstract

Chókwè Irrigation Scheme (CIS) has a crucial role of enhancing agricultural production and food security in Gaza Province in Mozambique. However, sediment deposition in the canal system in recent past has adversely affected water conveyance and distribution efficiency. To formulate best management practices for the sediment, there is need to understand its spatial characteristics and distribution. The objective of this research was to characterize sediment distribution in CIS using multivariate statistical analysis (MSA) technique. Variables were divided into two groups; canal channel factors (CCF) and water inflow factors (WIF), with respectively, twelve (12) and eleven (11) physicochemical parameters analyzed for nine (9) sampling stations. The sampling procedures were observed for six (6) months and two (2) seasons, respectively, during the months of June and August in 2018, for dry season (DS) and, of January and March in 2019, for the wet season (WS). Results indicated that F1 for CCF in the DS, explained 33.24% in variance and provided strong correlation towards water depth, canal depth, critical shear stress, plasticity index, electrical conductivity, exchangeable sodium percentage (ESP), concentrations of sodium, and combination of calcium and magnesium; whilst weak correlation was found for sediment settling velocity. During WS, F1 explained 48.09% in variance and provided strong correlation leaning to water and canal depths, critical shear stress, plasticity index, electrical conductivity, ESP, sodium adsorption ratio (SAR), concentrations of sodium, potassium, and combined calcium and magnesium. Conversely, for the WIF, F1 explained 30.59% for DS and 44.85 for WS. Sampling stations distinctly comprised the main clusters, both for CCF and WIF factors, both for DS and WS. The study revealed that canal channel factors and inflow factors appear t be behind sedimentation occurrence at CIS, with geometric, water inflow-flux and physicochemical parameters explaining the causes. These results may be useful in irrigation system management for improved agricultural productivity and enhanced food security