

## **ASSESSMENT OF NUTRIENT RETENTION IN YALA WETLAND ECOSYSTEM, KENYA**

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The Yala Wetland, a key ecosystem in Kenya, plays a vital role in provision of ecosystem services and by extension, a source of livelihoods for local communities, and a natural shield against environmental pressures. This study investigates nutrients retention capacity at the Yala wetland, focusing on the selected parameters at the inlet and outlet within a selected temporal span. Key parameters, including dissolved oxygen (DO), electrical conductivity (EC), water temperature, pH, total suspended solids (TSS), nitrogen (N), and phosphorus (P) concentrations, were monitored to assess temporal changes and nutrient retention. The mean DO concentration at the inlet exhibited significant temporal variation ( $F=7.315$ ,  $p=0.051$ ), while the outlet showed no significant changes ( $F=5.657$ ,  $p=0.063$ ). EC values at both sites varied significantly ( $F=28.387$ ,  $p=0.004$ ), with the inlet reaching a maximum of  $341.1 \mu\text{S}/\text{cm}$  in March. Nutrient analyses revealed that ammonium concentrations significantly differed across months at both the inlet ( $F=8.257$ ,  $p=0.035$ ) and outlet ( $F=7.463$ ,  $p=0.028$ ). Nitrate and total nitrogen concentrations showed no significant variation during the study period. Notably, the wetland acted as a nutrient sink, retaining 40% of ammonium, 30.52% of nitrate, and 28.57% of total phosphorus. Understanding these relationships is vital for safeguarding water quality and supporting biodiversity. In conclusion, ongoing research and proactive management approaches are key to preserving the integrity of Yala Wetland and strengthening its resilience against future environmental challenges.

**Author:** Mr MULI, Kelvin (Egerton University)

**Co-authors:** Prof. KIPKEMBOI, Julius (Kaimosi Friends University); Prof. KITAKA, Nzula (Egerton University); Dr ONDIEKI, Risper (Egerton University)

**Presenter:** Mr MULI, Kelvin (Egerton University)

**Track Classification:** Restoration of Ecosystems: Restoration of natural landscapes, to include mining areas, water catchment areas