Physical processes in the Rufiji delta and their possible implications on the mangrove ecosystem

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Abstract
The physical processes such as coastal currents, estuarine circulation and monsoon winds prevailing in the Rufiji delta are discussed. The relationship between these processes and the occurrence of long-term trapping of the river discharge and the outflow of waters from the mangrove swamps into the nearshore zone has been observed. The trapped waters in the nearshore zone significantly reduce the mixing between the estuarine and offshore waters, leading to the two waters having distinctive properties. The existence of the trapped waters in the nearshore zone is supported by evidence from a satellite image and aerial photograph and measurements of salinity and suspended sediment concentration. The trapping phenomenon is discussed in the light of its possible implications on the ecology of mangrove ecosystems. Trapping may explain the enhanced growth of the mangrove in the delta compared to other areas. This trapping effect may be providing more time for nutrient retention in the mangrove zone, incorporation of the decomposed leaf litter and fine sediments in the substrate, and settling of fruits and seedlings in the swamps, thereby enhancing the regeneration of the mangrove.

Key words
Mangrove swamps
Trapping
Mixing
Estuarine circulation
Coastal currents
Rufiji delta