

## Attributing the changes of the mangrove cover at Kalametiya to increased freshwater inflow over a few decades

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Kalametiya lagoon is situated in the dry zone of Sri Lanka on the southern coast. The information revealed by local residents indicate that there had been certain hydrological changes in the Kalametiya area over a period of 3-4 decades causing changes in mangrove cover, cover by certain mangrove assemblages and collapse of shell fish fishery. A part of the drainage water from Udawalawe Irrigation Scheme had been diverted to the ocean via Kalametiya lagoon by 1967. Later a permanent outfall had been constructed to carry the excess water to the sea to prevent inundation of upstream lands. According to villagers, the salinity of the lagoon water has decreased drastically and the shellfish fishery has collapsed as a consequence. In order to investigate these information scientifically, the changes of the mangrove cover and the water surface area were followed by remote sensing using aerial photographs taken before and many years after the Udawalawe Scheme came into operation (i.e. 1956 and 1994, respectively). The salinity regime and the hydrology patterns of the lagoon in the past were established using questionnaire-based study targeting men and women over 60 years of age and living in proximity to the lagoon. It was possible to establish convincingly that the salinity had been very high, even at times salt crystals had formed on the shoreline. There had been frequent closing and opening of the sand bar at the mouth. After the freshwater diversion, the water has become almost freshwater that does not support a good shellfish fishery. The mangrove area had increased from 24 ha in 1956 to 156 ha in 1994 by 550%. The newly grown area is located along the freshwater inflow canal and mainly comprised of *Sonneratia caseolaris*, which is a low-saline mangrove species. The siltation of the lagoon particularly at the inflow canal has increased. This can be expected since the water runs into the lagoon through paddy fields carrying suspended solids. Accordingly the open water surface has reduced and the setting of sediments favoured *Sonneratia* growth. Presence of young *Sonneratia* trees at the periphery of the mangrove cover indicates that further expansion of the mangrove is taking place at present. Therefore the influx of irrigation water had made severe changes to the lagoon environment. The results suggest that caution should be paid in projects where freshwater is diverted to a dry zone lagoon.