Upstream irrigation schemas as possible sources for changes of the mangrove cover of Kahandamodara, Kalametiya and Rekawa lagoons of Southern Sri Lanka

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Shrinkage of mangrove areas due to land based anthropogenic pressure is reported from the tropical world including Sri Lanka. Kahandamodara, Kalametiya and Rekawa are three estuarine lagoons located within about 15 km distance along the Southern coast of Sri Lanka. Three lagoons support physiognomically different mangrove flora. The changes of the mangrove cover from 1956 to 1994 were studied within a GIS using airborne remote sensing and ground verification.

The effects of anthropogenic activities on these mangroves during the period under consideration are evident by changes in the forest structure (*eg.* crown characteristics) and disappearance of some patches of the mangrove cover. However the net change of the mangrove cover of each lagoon was an increased. Percentage increases of the mangrove cover of Kahandamodara, Kalametiya and Rekawa from 1956 to 1994 were 25%, 550% and 28%, respectively.

This increase is spontaneous and not due to (re)plantation programs. The only way that allows such natural increases of the mangrove cover is an increase of the inter-tidal area of each lagoon or its usability for mangroves, by increasing the inflow of water into lagoons and/ or increasing the frequency of inundation of the peripheral land.

Three lagoons and their own catchments are located in the dry zone of Sri Lanka. The mean rainfall of these catchments is about 1500 mm $year^{-1}$ and it is seasonal and receives mainly from the NE monsoon. Udawalawe tank, an inland irrigational reservoir that was constructed by damming the river Walawe at 30 km upstream, started discharging irrigation water in 1967. Part of the drainage water has been diverted to catchments of the Kalamatiya lagoon, increasing the amount and widening the temporal distribution, of the fresh water inflow. Under The Muruthawela irrigation rehabilitation scheme 1,700 hectares in the left bank, 2,802 ha coming under Kirama Oya and 1,510 ha were planed to irrigate. From this large amount of additional drainage water directed to Kahandamodara and Rekawa lagoons. This new situation might have increased the inter-tidal area of lagoons and/ or the suitability of the peripheral land for mangrove expansion.

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