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## VEGETATION STRUCTURE AND COMPOSITION OF BEDDAGANA WETLAND SANCTUARY: ECOLOGICAL INSIGHTS FROM AN URBAN WETLAND IN SRI LANKA

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### Abstract

Urban wetlands are vital ecosystems that play a significant role in ecological stability and urban sustainability. The Beddagana Wetland Sanctuary, a Ramsar site in Sri Jayawardenapura Kotte, Sri Lanka, provides important services such as enhancing biodiversity, flood mitigation, water purification, and climate regulation. This study surveyed the vegetation structure, and species composition in the sanctuary using a plot-based sampling method. A total of six 10 m × 10 m plots were established randomly across representative habitat types within the study area. In each plot, overstory vegetation with a girth at breast height (GBH) of  $\geq 10$  cm was measured using a measuring tape and height was recorded using a laser rangefinder. Understory vegetation (individuals  $< 10$  cm GBH and above 1 m height) was measured within the same plots by counting the number of individuals per species. A total of 25 plant species belonging to 23 genera and 19 families were recorded across six plots. Of them, 19 were tree species followed by five shrubs, and one herbaceous species. *Syzygium caryophyllatum* was the most dominant species (Important Value Index IVI = 66), with high relative density but low average girth ( $18.5 \text{ cm} \pm 10.4$ ), indicating strong regeneration potential. *Pongamia pinnata* had the highest average girth ( $89.5 \text{ cm} \pm 10.4$ ) and contributed 27% to the basal area, highlighting its role as a key canopy species. Several mid-dominant species such as *Macaranga peltata*, *Cinnamomum verum*, and *Mangifera zeylanica* reflect succession processes. A reverse J-shaped girth distribution suggests active recruitment and forest regeneration, characteristic of a dynamic, multi-layered tropical wetland forest in transition. These findings emphasize the ecological resilience of the Beddagana Wetland Sanctuary and its critical contribution in supporting urban biodiversity and ecosystem services. To ensure the long-term health of this vital urban wetland, continuous monitoring and management are necessary to control invasive species and enhance its sustainability.

**Keywords:** Urban Wetland, Vegetation Structure, Regeneration, IVI