

Use of GIS to quantify land use transformation: A case study from Bellanwila- Attidiya Wetland, Colombo, Sri Lanka

Key words- GIS, wetland, land use, transformation

Wetlands offer many opportunities for human communities to manage water-related challenges and provide for a better quality of life for residents. Wetlands can be a tool for protecting water quality, abating flooding impacts, recharging groundwater, and providing fish and wildlife habitats. Nature adds to our quality of lives, and wetlands provide venues for recreation, healthy life styles and education. As in many other developing countries increasing developmental pressure has resulted in dramatic changes both in quality and quantity of wetlands in Sri Lanka. Most wetlands have been transformed into different human centred uses where little or no natural processes are then supported.

Bellanwila Attidiya (BA) wetland sanctuary, is situated in the highly populated Colombo District and has been subjected to various anthropogenic influences. In this research, I quantified the changes of BA wetland (372 ha in size), over the period of four decades focussing on transformation of wetland to non wetland land use. I applied ArcGis 10.0 software to identify and mapped the land uses in the years 1973, 1982, 2001 and 2013 using georeferenced aerial photographs and satellite images. Visual discrimination method was adopted to map areas of typical wetlands (marsh land, water bodies) and non wetland (paddy fields and home gardens). Then, I calculated area related to each land use category and the degree of transformation.

The results indicated that the extent of the water body has not changed. In contrast, marsh land has changed from 20 % of the total area to 34 % after four decades. Similarly, home gardens have increased from 33 % to 51 % whereas paddy fields which covered 33 % of the study area in 1973 has totally disappeared since 2001. Although wetland area as a total has not shrunk in size, a shift in land use is evident as loss of paddy land due to encroaching human habitation.

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