

D-05: A Study of the ecology of Handapan villu at Polonnaruwa with special reference to its conservation

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The flood plain of Mahaweli river covers an area of 50,000 ha. Various ecological zones can be observed within this area such as river channels, riverine marshes or villus (defined as shallow saucer shaped depressions), seasonally flooding grasslands and fresh water swamps forests.

Villus maintain their water level by the annual cycle of rainfall and river flooding. The 38 villus within the Mahaweli flood plain occupy an area of about 10,000 ha. Handapan villu to which is connected the Bandiya villu with an area of 769 ha, is the largest among this cluster of villus and is located at longitude of $70^{\circ} 40'$ to $70^{\circ} 57'$ N and a latitude of $81^{\circ} 02'$ to $81^{\circ} 05'$ E in the Polonnaruwa District.

The villu retains water throughout the year and is fed by Kalinga Yoda Ela through Mahaweli during the rainy season and it flows into Mahaweli again during the dry season thus maintaining a certain hydrological balance. The villu acts as a filter to much of the agrochemical effluents that flow into the villu with the Mahaweli waters during the wet months.

This study was undertaken to investigate the water quality of the villu during 2 seasons in order to assess the effects of Mahaweli waters that bring agrochemical residues into the villu and also to study the biodiversity within the villu and its environs. Ten sampling stations were identified and physico-chemical parameters

such as temperature (air & water), visibility (Secchi disc depth), suspended solids, hardness, pH, alkalinity, conductivity, chlorinity and nitrate ion concentrations were measured at the 10 sampling points.

Vegetation extending from the bank outwards was identified through line transects in addition to the aquatic flora such as phytoplankton and aquatic macrophytes. A bird count was carried out, villu mammals and reptiles on the environs were identified. The agrochemicals used for cultivation in the area were identified and a detailed land use map was compiled.

Wide variation in the measured physico-chemical parameters were observed during the 2 seasons indicating the influence of effluents on rainfall. Seventy species of plants were identified through transect studies and 23 aquatic and related plants were collected and identified. Twenty five species of phytoplankton were counted which showed spatial and time variations in abundance and occurrence. The highest diversity was among the avifauna specially among the water birds, where 64 species of resident and migrant birds were identified. Indian Little Grebe, Little Cormorant, Pond Heron, Little Egret Lesser Whistling Teal, Indian Pea Fowl, Pheasant Tailed Jacana are some of the common water birds observed.

Villus provide ideal environs for avi-fauna. Among the birds identified during this survey were 28 migrants, 6 endemics. Any adverse impacts through human activities will be specially detrimental to this large avi-fauna. The large population of reptiles, 4 endemic fish species further substantiate the need to conserve villus. Seepage of agrochemicals into villus through upstream agriculture activities poses a threat to villus as they act as sinks for these effluents.

Villus are one of the most productive ecosystems and they maintain a high diversity of flora and fauna. The necessity of conservation of villus is further recognised through this study.

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