D-26: Nutrient loading to the lagoon at the international RAMSAR wetland site (Bundala), due to cattle grazing

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This study was conducted in five selected water bodies (Benda weva, Bundala, Emblikala, Malala and Koholankala lagoons) at the international RAMSAR wetland site Bundala. Apart from these, Weligatta ara a drainage inlet to the Embilikala lagoon was also taken into consideration.

To quantify the nutrient load added to water bodies by cattle and buffalo residing close to water bodies, their dung and urine were analysed for phosphorous, potassium, magnesium and calcium. Population analysis and behavioral study of cattle and their dung decay rates too were studied. Nutrients such as calcium, magnesium, potassium, phosphorous, nitrate, nitrite and ammonia in water (at two depths) and in sediments were analysed. This study was conducted between June and August 1997.

The highest population density is recorded from Embilikala while the lowest is from Malala. The amount of phosphorous present in urine is negligible. Out of the four nutrients analysed the highest concentration is shown by potassium 17323.0 ± 344.4 ppm (mean $\pm$ std error) and the lowest by magnesium (116.2 ± 3.35) in urine. Of cowdung the highest concentration is shown by nitrogen (1025.0 ± 250.65 ppm) and the lowest by calcium (0.8921 ± 0.117 ppm). Behavioral studies indicate that the average defecation rate is 10 times/day and the urination rate is 9 times/day. Comparing the 5 sites, the highest nutrient load released from urine and cowdung is observed at

Embilikala and the lowest at Malala. The nutrient load inputs at the five sites decrease as follows, Embilikala> Benda-weva> Bundala> Koholankala> Malala. Due to decomposition of cowdung and urine, nutrients are released to the environment. Decay rate of a dung pile is about 0.01 /day. The mean survival of a dung pile is about 38-48 days. The pastures and water bodies are possible contamination targets due to these excreta.

High concentrations of nutrients were found in water and sediments. The levels of nutrients in sediment are very much higher than that of nutrients in water. Nitrate and phosphate which act as limiting nutrients are exceedingly high. The lowest levels of nitrate and phosphate recorded were 35.29 ± 2.09 ppm and 0.44 ± 0.33 ppm at Bundala while highest levels of nitrate and phosphate 230.4 ± 76.69 ppm (Koholankala) and 16.49 ± 1.33 (Bundala) respectively.

By comparing chemical parameters of water and sediments it is evident that except Benda weva all other water bodies indicate conditions favourable for eutrophication. Therefore the management of nutrients is of great importance for this ecosystem.