

E2-49 Buffer intensity: risk of acidification of surface water in Sri Lanka

E I L Silva, L Manuweera

(*Institute of Fundamental Studies, Kandy*)

The susceptibility of surface water to acidification by acid deposition is always determined by buffer intensity which is an intrinsic function of pH. The buffer intensities for 139 sites representing 83 river locations, 41 manmade lakes (irrigation and hydropower reservoirs) and 15 coastal lagoons were computed using pH and total alkalinity values. Sites were located island-wide except the northern and north-eastern areas and sampling was carried out for the period of February to April 1994. Inter-site variability was analyzed using one-way ANOVA coupled with DMRT.

The highest mean buffer intensity of $55.05 \pm 21.18 \times 10^{-4}$ moles l^{-1} pH^{-1} , computed for the dry zone rivers (<100 m elevation) was significantly different from the other types of water. The mean buffer intensities of dry zone reservoirs (41.4×10^{-4} moles l^{-1} pH^{-1}) and the lagoons (41.7×10^{-4} moles l^{-1} pH^{-1}) were more or less similar and were not significantly different from that of the dry zone rivers draining the 100-500 m elevation ($37.9 \pm 17.86 \times 10^{-4}$ moles l^{-1} pH^{-1}). The buffer intensities of the reservoirs located ($21.55 \pm 6.19 \times 10^{-4}$ moles l^{-1} pH^{-1}) and the rivers draining in the 100 and 500 m amsl ($18.52 \pm 8.65 \times 10^{-4}$ moles l^{-1} pH^{-1}) and above 500 m elevation in the wet zone (13.10×10^{-4} moles

1^{-1} pH^{-1}) were also not significantly different but significantly higher than that of the rivers draining the lowest elevation in the wet zone ($11.33 \pm 4.16 \times 10^{-4}$ moles 1^{-1} pH^{-1}). The lowest mean buffer intensity of mountain reservoirs located 500 m amsl ($8.09 \pm 4.61 \times 10^{-4}$ moles 1^{-1} pH^{-1}) was not significantly different from those of the rivers draining the lowest elevation and 500 m amsl in the wet zone. These results lead to a distinct classification of surface water in Sri Lanka into 5 categories with respect to their buffering capacities and the mountain reservoirs and the headwaters streams could be more susceptible for episodic acidification.