

Industrial Expansion in Attanagalu Oya River Basin: Implications of food Industry on Water Resources

W.M.N.L Weerasooriya*, N.D.K Dayawansa¹, M.I.M Mowjood¹ and R.P. De Silva¹

Postgraduate Institute of Agriculture
University of Peradeniya
Sri Lanka

Attanagalu Oya river basin in the western province of Sri Lanka has witnessed a rapid industrial growth over the last twenty years due to its accessibility to transportation, infrastructure and wealth of water resources. This study assesses how industrial expansion has exerted pressure on freshwater resources, focusing on the food and beverage industry. Methodology involves the analysis of rainfall from five gauging stations, monthly river discharge data from Dunmale (2005-2023), and water quality measurements. Water quality was monitored at monthly intervals for six months (January to June, 2025) at sampling 10 points for Dissolved Oxygen (DO), Chemical Oxygen Demand (COD), Total Dissolve Solids (TDS), Practical Salinity Units (PSU), and pH. Monthly discharge analysis indicates two distinct periods: high flow (May and October – November) and low flow (February and August). Currently, a total of 47 factories are located within the study area. Downstream water quality (samplings point 6-10) shows severe pollution, with persistently low DO and statistically significant monthly variation ($p < 0.05$). During the low flow in February, DO decreased in midstream to downstream areas, accompanied by elevated COD (up to 217 to 189mg/ L) and elevated Salinity and TDS (741 mg/L) exceeding SLS limit of 500mg/L. In contrast, high flow in May improved water quality through dilution, reducing COD to 6 – 98 mg/L, TDS to 49 – 68 mg/L and PSU to 0.04- 0.06. Overall the results confirm that river discharge dynamics directly influence pollutant dispersion, and industrial expansion has led to measurable freshwater degradation. Evident-based, sector-specific regulations are required for water abstraction and effluent discharge.

Keywords: Attanagalu Oya, Industrial expansion, water quality, food and beverage industry

*Corresponding author: Nisansala.weerasooriya@yahoo.com; ORCID: 0009-0003-1735-5158

¹Department of Agricultural Engineering, Faculty of Agriculture, University of Peradeniya