Title of Article: Study of Auto Purification Capacity of River Atuwara in Nigeria
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Abstract: The aim of this paper was to study and predict the self-purification capacity of River Atuwara. This was done primarily by measuring the Dissolved Oxygen (DO) downstream of a pre-selected pollution discharge point on River Atuwara and then predicting the same using the modified Streeter-Phelps equations. Other data gathered from each of the 17 sampling stations on River Atuwara and used in the analysis included Biochemical Oxygen Demand, (BOD), pH, stream velocity, stream depth and distance. Predicted DO deficit trend lines were first fitted by retaining the original re-aeration coefficient component, $k2$, of the modified Streeter-Phelps equation (USGS equation) and subsequently by substituting it with Atuwara reaeration coefficient model. It was found that the latter displayed better predictive capacity. Results also demonstrated that the auto-purification capacity of the river which is already limited by the relatively low DO saturation level is further threatened by the wastes being discharged into it at varying intervals. Some of the wastes which are non-biodegradable and acidic were also found to be interrupting the auto-purification processes of the river. Water from River Atuwara requires treatment before it can be considered safe for consumption by its current users.
Keywords: Surface Water Quality, Pollution, BOD, stream reaeration coefficient, River Atuwara