

# Impact of Human Activities on Nutrient and Trophic Status of some Selected Lagoons in Ghana

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## Abstract

The nutrient and trophic status were used to assess the impact of human activities on lagoon by determining the trophic status of the lagoons and then using nutrient parameters and transparency in a form of model to predict the trophic status index (TSI) of the lagoon waters. The trophic index of Benya, Nakwa, Amisa and Nyanya ranges between 35.0–39.0 and falls within Carlson's TSI range scale of 30–40, which implies that their waters are oligotrophic. The Oyibi lagoon is mildly eutrophic (Carlson's TSI scale of 56) in the riverine portion. However, at the seaward end it has TSI of 42, which is moderately clear. Similarly, Muni lagoon is moderately clear with TSI range of 35.8–43.1. The Sakumo II lagoon is hypereutrophic at the riverine end (Carlson's TSI of 87.8). The seaward end is oligotrophic. The high phosphorus (231.9 kg/day) and nitrogen (927.9 kg/day) recorded at Nyanya lagoon are as a result of domestic activities mainly from the wastes generated from humans at the lagoon and its surroundings. The use of nutrients and transparency, in predicting the trophic status of lagoons and coastal waters is a new and emerging scientific way of looking at lagoon trophic status. The nutrient inputs into lagoons, as well as transparency, are direct impacts of human activities. The model has proved to be useful in explaining the impact of human activities on the trophic status of lagoons in Ghana. The model was assessed by predicting the observed *versus* predicted, and this showed a performance index ( $R^2$ ) of 95.1%. This shows that the model is able to use various nutrient and transparency values to predict the trophic status of lagoons. The model is able to predict lower or oligotrophic TSI values better than higher or hypereutrophic values. The model has then been used successfully to predict various TSI values from the lagoons.