

## Greenhouse Gas Emissions from a Tropical Eutrophic Freshwater Wetland

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**Abstract :** This study measured the fluxes of greenhouse gases (GHGs) i.e. CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O from a tropical eutrophic freshwater wetland (‘Sonso Lagoon’) which receives input loading nutrient from several sources i.e. agricultural run-off, domestic sewage, and a polluted river. The flux measurements were carried out at four different points using the static chamber technique. CO<sub>2</sub> fluxes ranged from -8270 to 12210 mg.m<sup>-2</sup>.d<sup>-1</sup> (median = 360; SD = 4.11; n = 50), CH<sub>4</sub> ranged between 0.2 and 5270 mg.m<sup>-2</sup>.d<sup>-1</sup> (median = 60; SD = 1.27; n = 45), and N<sub>2</sub>O ranged from -31.12 to 15.4 mg N<sub>2</sub>O m<sup>-2</sup>.d<sup>-1</sup> (median = 0.05; SD = 9.36; n = 42). Although some negative fluxes were observed in the zone dominated by floating plants i.e. *Eichornia crassipes*, *Salvinia*, and *Pistia stratiotes* L., the mean values indicated that the Sonso Lagoon was a net source of CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O. In addition, an effect of the eutrophication on GHG emissions could be observed in the positive correlation found between CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O generation and COD, PO<sub>4</sub><sup>-3</sup>, NH<sub>3</sub>-N, TN and NO<sub>3</sub><sup>-</sup>. The eutrophication impact on GHG production highlights the necessity to limit the anthropic activities on freshwater wetlands.

**Keywords :** eutrophication, greenhouse gas emissions, freshwater wetlands, climate change

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