

The impact of land-use changes on greenhouse gases along the oil palm plantation to riparian buffer strips

ABSTRACT

The impact of land-use changes on soil greenhouse gas flux in a tropical forest, nitrous oxide (N₂O), carbon dioxide (CO₂), and methane (CH₄) are few to be understood. This study is to assess the magnitude, short-term spatial, and temporal variability in GHG of land-use change oil palm plantation and the importance of riparian strips adjacent to the oil palm as a source of N₂O and CH₄. Runoff and leaching of fertiliser and herbicides routinely used in oil palm management will accumulate in properly working riparian buffer strips, leading to raised soil nutrient, thus giving sources of GHGs. We installed measurement transects from three mature oil palm plantations (Site 1, Site 2, and Site 3) to adjacent riparian buffer areas in SAFE Projects landscape (<https://www.safeproject.net>), SE Sabah. From this study, we found that CH₄ emission is higher in oil palm ($91.02 \pm 40.18 \mu\text{g m}^{-2} \text{ h}^{-1}$) whilst N₂O and CO₂ shows higher in riparian, $88.49 \pm 90.52 \mu\text{g m}^{-2} \text{ h}^{-1}$ and $267.80 \pm 264.38 \text{ mg m}^{-2} \text{ h}^{-1}$ respectively.