

# Development of Emission Factors for GHGs and Associated Uncertainties

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## **Abstract**

Reservoirs and hydroelectric dams need a closer analysis of the impacts due to dams, both in terms of GHG-emissions and the uncertainties associated with estimation. Which emissions to count as net emissions and how to deal with the emissions of CO<sub>2</sub> and CH<sub>4</sub> when they occur at different periods are some of the pertinent issues. The net emissions are the emissions which take into account all the sources as well as sinks of GHGs in the watershed. These emissions may differ significantly from one geographical region to another and depend, inter alia, on temperature, wind speed, solar radiation, physico-chemical water quality parameters, adjacent biospheric composition and several dam operating conditions as well as the age of the reservoir. In addition, there may be diurnal, seasonal and annual variations too. Moreover, the main scientific debate at the moment is centered around the uncertainties associated with extrapolating emissions measured at selected parts and selected intervals of time, there is a strong need for developing region-specific spatio-temporal emission-factors (functions). This will not only reduce the spatial uncertainties but also the uncertainties associated with diurnal, seasonal and annual variations. This paper presents and analyses development of one such predictive tool as emission factors for vegetated and un-vegetated zones. The models are different for running (river) and stagnant (lake) waters and have wider applications in estimating region-specific methane emissions, which is an important requirement under IPCC guidelines.