Quantifying Greenhouse Gas Emissions from On-site Sanitation Technologies in Nepal using Refined Intergovernmental Policy on Climate Change Guidelines

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On-site sanitation systems (OSS), such as pit latrines and septic tanks, are widely used in low and middle-income countries (LMICs) like Nepal due to their practicality and economic viability. These systems have been found to contribute significantly to greenhouse gas (GHG) emissions and were recorded to produce 4.7% of total global GHG emissions. An effort has been made to record and present this issue to the United Nations Framework Convention on Climate Change (UNFCCC) through Intergovernmental Policy on Climate Change (IPCC). Despite the effort being made globally, Nepal still needs to catch up. Nepal has not incorporated wastewater as a prioritized sector in reducing emissions in any of the reports of Nationally Determined Contribution (NDC), which could have underestimated the national GHG emission. This study aims to estimate the contribution of GHG emissions from different OSS using refined 2019 Intergovernmental Policy on Climate Change Guidelines considering two reference years, 2011 and 2021. The annual total GHG emissions from the OSS are estimated to be 483.33 Gg CO_2-eq and 1256.37 Gg CO_2-eq for 2011 and 2021. The total emissions from OSS alone account for 1.7% of the total GHG emissions from the country, which infers that the GHG emissions from the OSS are non-negligible and must be accounted for in the national GHG inventories and for building better nationally determined contributions (NDCs).

Keywords: Greenhouse gases, On-site sanitation, IPCC, LMICs, Nepal.