

<https://doi.org/10.7250/CONNECT.2024.028>

CHALLENGES IN STANDARDIZING GLOBAL EMISSION FACTORS FOR PEATLANDS

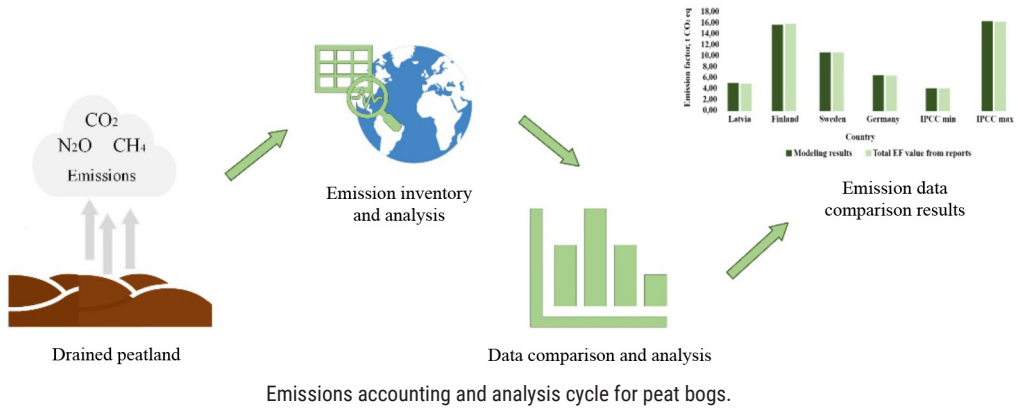
Dita SKUJEVSKA^{1*}, Maksims FEOFILOVS², Francesco ROMAGNOLI³

¹⁻³ *Institute of Energy Systems and Environment, Riga Technical University, Āzenes iela 12/1, Riga, LV-1048, Latvia*

* **Corresponding author.** Email address: dita.skujevaska@rtu.lv

Abstract – Peatlands have a crucial role in the global carbon cycle, acting as significant carbon sinks, but become a significant source of greenhouse gas (GHG) emissions when peat extraction is taking place. This article presents a comprehensive overview of peatland ecosystems, emphasizing their classification across various climatic zones and the complex set of different characteristics that determine contribution to GHG emissions. Currently, inconsistency exists in definition of emission factors used between countries leading to varied approaches in estimating peatland emissions and posing significant challenges in the comparison and aggregation of global data on peat extraction related GHG. The aim of the study is to analyse the disparities in emission factors and calculation methodologies employed by different countries. Data from national GHG emission reports are submitted under the UNFCCC and the Kyoto Protocol. Emissions report data calculations and emission factors can be based either on nationally determined data or on data specified in the IPCC guidelines. Consequently, emission factor data for four countries – Latvia, Finland, Sweden and Germany – are collected and processed, which are compared to IPCC guideline data. The data were compared in two ways: by equating units of measurement and by modelling. The results have shown the pronounced difference between the emission factors of each country. However, all these factors are lower than the maximum values specified in the IPCC guidelines. It was also determined that comparing the total emission factors with the modelled results, no significant difference is observed between these results. The study concludes that emission factors are predetermined differently for each country, and it is not possible to specify the differences among assumptions for parameters included in the determination of the emission factors. The results suggest that there is a need for development of more transparent accounting of emissions with regard to the diverse environmental and anthropogenic factors influencing peatland ecosystems. Such factors as composition, depth of peat, water table levels, and local land-use practices, further compound this variability in emission accounting. Addressing these challenges is crucial for enhancing the accuracy and reliability of GHG emission reporting under international frameworks, such as the United Nations Framework Convention on Climate Change and the Kyoto Protocol.

Keywords – *Carbon sink; climate change, emission inventories; peatland emissions; peat and peatland types; tier*



ACKNOWLEDGEMENT

The work has been developed as part of the Fundamental and Applied Research Project “Sustainable Strategies for the Restoration of Peat Mining Sites (Peat4Res)”, project no. lzp-2022/1-0405, within the framework financed by the Latvian Science Council.



FLPP
FUNDAMENTĀLIE UN
LIETIŠKIE PĒTĪJUMU
PROJEKTI



Peat4Res