Challenges in Standardizing Global Emission Factors for Peatlands

Dita Skujevska, Maksims Feofilovs, Francesco Romagnoli

Riga Technical University, Institute of Energy Systems and Environment

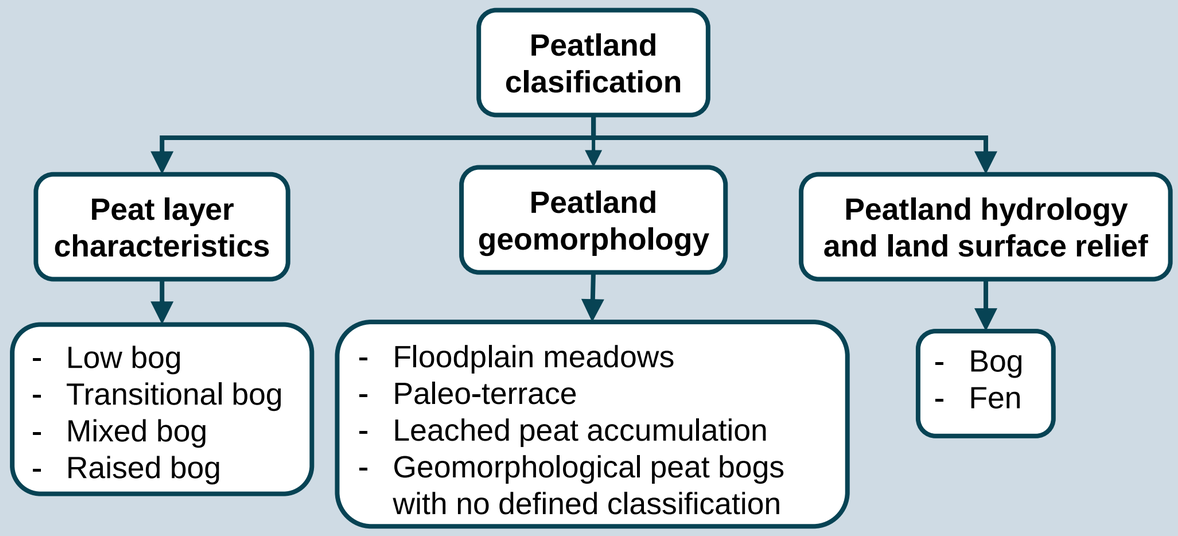
Contact information:

Azenes street 12/1

Riga, LV1048, Latvia

dita.skujevska@rtu.lv

Development of a transparent approach for accounting of the environmental and anthropogenic emissions in peatlands is highly important!



– Classification of peat and peat bogs was under active development, from the late 19th to the early 20th century

– Peat bogs are the largest terrestrial carbon storage in the world. Carbon storage in bogs is 3.5 times greater than in other ecosystems in subarctic and boreal climate zones.

– Every year countries provide GHG inventory reports the include emission factors but in these repots it is not explained the methodology used to determine or calculate them.

– There is large difference between Latvian, Finish, Swedish and German emission factors.

Introduction

Globally, peat bogs cover only 3% of the total land area, yet they can accumulate around 23 g C m^{-2} y^{-1} of carbon every year. Drainage of peat bogs leads to the release of large amount of emissions into the atmosphere, which need to be accounted for in GHG inventory reporting. Due to the fragmented classification of peat bogs and the lack of information in reports, it is di fficult to find explanation for emission factors used among countries reporting their GHG inventories.

Comperison method

Emission factor data were compared for four countries – Latvia, Sweden, Finland and Germany. The data was obtained frome the GHG inventory reports of these countries. However, these reports present data with different measurement values, which were equalised during the development of this work.

The first step of the data analysis includes the conversion of emission data to the same units of measurement.

$$CO_2 = CO_2 - C * \left(\frac{M_{CO_2}}{M_C}\right)$$

After calculating N_2O, CH_4 and CO_2, the conversion of emission factor to the same measurement units (t CO_2 eq) was performed

$$CO_2eq = EF * GWP$$

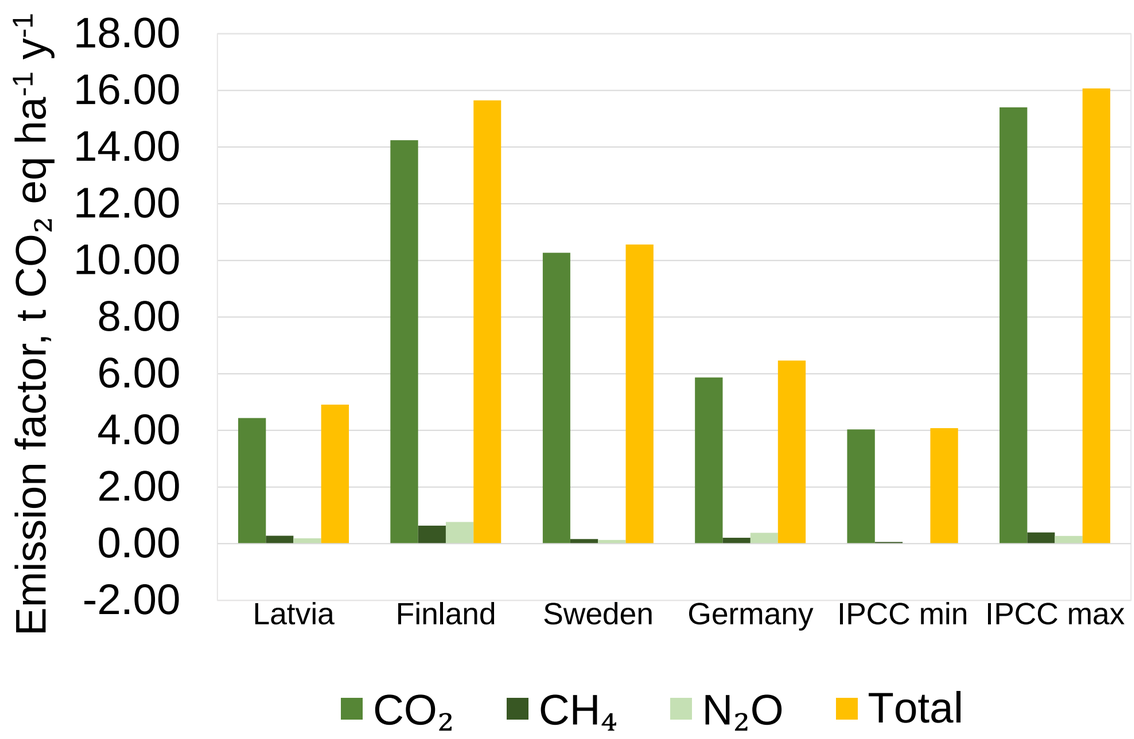
Results

A comparison between four country and IPCC EF values showed the following:

– The Latvian and German CH_4 and N_2O EF values are similar, however the German CO_2 value is 1.43 t CO_2 eq ha^{-1} y^{-1} higher than the Latvian;

– Finland has the highest EF of the countries considered and the total EF is 0.42 t CO_2 eq ha^{-1} y^{-1} lower than the IPCC total EF value;

– After examining Swedish GHG emissions report and after the calculations was done it is possible to determine that the Swedish EF is equal to the IPCC guideline mean value.



Conclusions

– There is lack of information regarding factors that are used for carbon emission estimations among countries;

– There is no one specific method for classifying peat and peatbogs;

– No unified classification of peat bogs and their relation to carbon cycles leads to incorrectly accounted and not comperable emissions rates among countries;

– **It is necessary to estamblish a globally accepted framework for classifying peat and peat bogs, alongside a standardized methodology for calculating emissions from these carbon-rich ecosystems.**