How to make Blue Carbon accounting scientifically reliable and socially fair – an example from the MANCOGA project in Ghana.

David Kaiser[1], Bryce Robert van Dam[1], Edem Mahu[2], Benjamin Osei Botwe[2], Holger Brix[1]

1 Hereon Helmholtz-Centre, Hamburg, Germany

2 University of Ghana, Legon, Ghana

Mangroves are often presented as Nature-based Solution for, among others, Blue Carbon. However, a lack of locally relevant data makes ecosystem service estimates highly uncertain, and outcomes do not always benefit local traditional rights holders. Currently, no independent, internationally accepted framework exists for the accounting of carbon dioxide removal (CDR) in coastal vegetated ecosystems. Carbon credits are created and sold by private entities using a variety of bespoke calculations, with little oversight. This has led to criticism of CDR accounting and the true climate benefits. We propose an ambitious new framework for Blue Carbon monitoring, reporting and verification, centered on a Digital Twin of Blue Carbon ecosystems.

In coastal Ghana, mangroves remain understudied but overexploited because a value chain centered on firewood provides livelihoods to numerous stakeholders. In the MANCOGA project, stakeholders from local communities to national decision makers use co-design to identify alternative and sustainable mangrove use. We investigate effects of current and possible alternative management on carbon sequestration, and suitable metrics for issuing carbon credits. Results indicate a strong positive relationship between mangrove age after cutting and carbon density, demonstrating the potential for Blue Carbon credits; halted deforestation will lead to reduced carbon emissions and re/forestation to carbon dioxide removal. Stakeholder engagement reveals the acceptability and feasibility of mangrove Blue Carbon as a sustainable livelihood for landowners. However, challenges for other stakeholders at the bottom of the existing value chain, as well as cultural and economic factors, including a lack of affordable alternative fuel sources, inhibit the uptake of management changes. In this setting, reliable and fair CDR accounting is required to build sustainable benefits for communities and climate.