Biogeosciences Discussions

Biogeosciences Discuss., referee comment RC1
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Comment on bg-2021-237

Anonymous Referee #1

Referee comment on "Ideas and perspectives: Enhancing research and monitoring of carbon pools and land-to-atmosphere greenhouse gases exchange in developing countries" by Dong-Gill Kim et al., Biogeosciences Discuss., https://doi.org/10.5194/bg-2021-237-RC1, 2021

Overall I think the paper is well written and is within the scope of a Biogeosciences's "Ideas and Perspectives" paper. The abstract, title and figures are all appropriate. It raises important issues of inequalities in science and carbon stock and flux data scarcity across certain regions of the globe, which are mostly a result of these inequalities. I particularly liked figures 1 to 3, as they very clearly illustrate the issue. The paper focuses on the use of what is termed "appropriate technology and approach" and how it can be used to overcome primarily financial and technological barriers to the acquisition of data on carbon stocks and fluxes. However, I feel the authors could be a bit more cautious about not overselling the ability of AT&A to overcome these barriers and solve the issue of carbon stock/flux data scarcity. It is not always the cost or the technological complexity of the method that is the prohibiting factor in data acquisition. I do not disagree with what the authors have written, but I would like to see a more balanced discussion, which gives perhaps a more realistic consideration of the role that AT&A can play.

Some specific points for discussion, which the authors do to a degree mention, but I feel do not give enough consideration to or acknowledgement of, are the following:

-Fieldwork: Fieldwork, even when using low tech methods, is expensive, but especially so when operating in a low-income country which lacks public transport infrastructure, meaning that private transport is often required, or working in large, remote forested areas where accessing the field site is difficult and time consuming and therefore

expensive. Filling in the blanks on the map at a sufficient temporal and spatial scale with in situ measurements is unavoidably going to require a lot of funding.

-Sometimes there is no alternative technology/approach: It would be nice for balance if in section 4 the authors acknowledged that sometimes there is no cheaper or low-tech alternative. For example the authors mention the lack of flux towers early on in the text. Whilst there are lower cost alternatives for measuring GHG fluxes on a very localised spatial scale and remote sensing products give you a regional scale estimate, is there a low cost, low-tech for measuring fluxes at an ecosystem level?

-The way science funding is awarded and how that impacts long term monitoring and participation equality in collaborations: In section 3.2 and in line 155 & 391 the authors mention the lack of equality in relationships between high-income and low-income country collaborations and a lack of long-term investment in these relationships. This to me is one of the most important issues. Whilst I believe that high-income country collaborators could go much further in their efforts to address these issues, one thing not really mentioned and which helps drive this outcome is the way that science is funded. Even if there is a genuine will on the side of the high-income country partner, the short-term basis on which funds are awarded prohibits long term monitoring, or long-term technological support or training for low-income country partners. And often funding bodies stipulate how project money can be spent, limiting what can be spent on partners at other institutions in other countries. Therefore perhaps a brief comment on the how the structure of science funding helps to inhibit the capacity building of low income countries to monitor carbon fluxes/stocks.

More minor comments are as follows:

-L167-168/286-287- is it really that likely that funders/policy makers are not aware of the importance of research into carbon stocks/fluxes? I would say it is well recognised at this level that C and GHG data is important.

-L299-300: “Fourth, AT&A may mitigate, but does not solve, the problem of technical capacity in less-developed countries.” More discussion and consideration of this point is what I am referring to above in the general comments.

Minor typos:

-L139 – should read “However”

-L160- should read “support”

-L369-shoud read “country”

-L374- are some words missing here?

-L376-are some words missing or the sentence needs restructuring?

-L385- should read “citizens”

-L390-should read “AT-A”

-Figure 5. White 4 and 5 are not referred to in the caption, so I wonder why they are there.