TABLE FOR COMMENTS

Name of submitter: \_\_Johanna Depenthal\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Affiliated organization of the submitter (if any): \_\_Independent\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Contact email of submitter: \_\_\_jdepenthal@ufl.edu\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| **#** | **Para No./Annex / Figure / Table** | **Line Number** | **Type of comment****ge** = general**te** = technical **ed** = editorial  | **Comment** **(including justification for change)** | **Proposed change** **(including proposed text)** | **Assessment of comment****(*to be completed by UNFCCC secretariat*)** |
| **1** | **Pages 19-20, 51-52** |  | **te** | The WCMC 2010 basemap used as the starting point for above-ground biomass modelling is 13+ years out of date (data used in the map ranges from 1982-2010), compiled from multiple sources, and unvalidated. Pages 51-52 also highlight that “errors in the AGB input layer” have contributed to significant variability in the standard deviations of rmax and k (used to calculate AGB growth): the authors note that “we are planning to improve MoFuSS to better accommodate the errors inherent in large spatial AGB maps; however, this is still a work in progress and was not prepared for this assessment" (p. 52).The list of potential AGB databases on page 19 does not list any databases with data more recent than 2012, yet the technological advances in remote sensing, data availability, data quality, and data resolution have been significant over the past decade (particularly in terms of increasing the number of bands/data layers for better distinction between land cover types, 3D LiDAR scanning, and smaller pixel sizes). Two of the most promising alternative AGB databases include the [GEDI databases](https://gedi.umd.edu/data/products/) (developed in part by NASA using the International Space Station and specifically geared towards AGB estimations) and the [ESA’s Climate Change Initiative Biomass project](https://climate.esa.int/en/projects/biomass/data/#:~:text=The%20primary%20science%20objective%20ESA's,supporting%20quantification%20of%20biomass%20change.) datasets. The ESA’s Climate Change Initiative Biomass project dataset in particular seems to meet all the criteria specified by the Information Note while far surpassing the quality of the WCMC 2010 data: it has a 100 m x 100 m spatial resolution (9x finer grain than the WCMC data), has data as updated as 2020 with the option to compare against a baseline year from 2010, is single source, open access, validated against field inventory data, available in geoTIFF format, and has pixel-level uncertainty estimates. | More recent databases (in particular, the GEDI L4B Gridded Aboveground Biomass Density Database and the ESA’s Climate Change Initiative Biomass project datasets) should be rigorously considered as alternatives to the WCMC 2010 basemap and listed among potential databases on page 19. If an updated database is found to be suitable, the MoFuSS model should be re-run on the base of an updated AGB basemap.Proposed text: “This model uses [insert name of chosen database] as the baseline for AGB estimates. The database is single-source, validated, high resolution, and based on high quality observational data from within the last 5 years. MoFuSS has also been revised to better accommodate errors in large spatial AGB maps in such a way that reduces variance in rmax and k values.” |  |
| **2** | **Pages 19, 65** |  | **te** | Equally concerning as the age of the AGB basemap is the apparent lack of model calibration and validation (calibration is the process of fine-tuning the model until it can be validated, i.e., confirmed as valid when checked against real-world data). While the page 19 references using 2010 as a baseline year in order to “calibrate our models to observed changes that occurred over that timeframe,” it is unclear what, if any, data the model was calibrated against since no databases with observed, recent AGB estimates were included in the model. While Ghilardi et al. (2016), which describes the first version of the MoFuSS model, explicitly discussed calibrating the model against maps of forest cover change from Global Forest Watch dataset during their Honduras case study, the current Information Note states that the model’s deforestation module was deactivated for this simulation due to issues with calibration and validation, in particular because it was “very difficult to calibrate a single model for an entire continent” (p. 65). This raises concerns about the reliability of the model outputs, especially given the simulation’s forty-year length and its large geographic scope. | Model outputs should undergo a process of calibration and validation against real AGB estimates and patterns of deforestation, and adjustments made to the model as necessary.Proposed text: “The MoFuSS model has undergone a rigorous process of validating modelled AGB estimates and patterns of deforestation against the following sources of observational data…” |  |
| **3** | **Appendix 2, also pages 6 and 23.** |  | **te** | The exclusion of the MoFuSS deforestation module from this simulation (Appendix 2) is also cause for concern because other common sources of large-scale deforestation (agricultural expansion, land clearing for other purposes), are not currently reflected in the model. The use of land clearing by products for woodfuels is also not included (p. 6). As explained in the Information Note, “our simulations would be overestimating regrowth and underestimating fNRB” in such areas (p. 23). Considering the wide variety of factors that contribute to large-scale forest clearing, this omission seems of critical importance.  | Ideally, changes would be made to the MoFuSS to incorporate these critical sources of deforestation. If these sources of deforestation cannot be accurately modeled at large scale, perhaps an adjustment factor can be added to the fNRB?Proposed text: “The following changes (explain) have been made to the deforestation module to enable it to be incorporated for large-scale modelling.” OR“In light of the influence of deforestation motivated by agricultural expansion or land on fNRB but the difficulties modelling these other sources of deforestation at the regional and global scale, we recommend that fNRB values be increased by an adjustment factor to compensate for this omission.” |  |
| **4** | **Pages 4, 5, 18, Figure 2, pages 25-26** |  | **te** | A clearer summary of the data sources, data age, assumptions, and potential limitations of the different variables (such as population distribution, population growth, road network, the fuel demand models, etc.) incorporated in this version of the MoFuSS model would be greatly appreciated. The source of the WHO projections for four African countries through 2050 (listed as “WHO’s Global HH Energy Model (2010-2050)” in Figure 2 references an academic paper with estimations through 2030 and the WHO’s clean energy portal, which does not have any links matching that exact description, making the exact data source unclear. | Add a table or appendix with more specific information on the data sources, assumptions, and limitations for variables contributing to estimates of fuelwood demand, similar to the example of Table 1 in the Ghilardi et al (2016).Proposed text: “For more information on the data sources, assumptions, and limitations for variables contributing to estimates of fuelwood demand, see Table X” |  |
| **5** | **Pages 6, 25, 31, 33, 35, and 37** |  | **te/ed** | Clarification on the extent to which commercial woodfuel is accounted for (pages 6 and 25 imply that commercial woodfuel is not accounted for in these simulations; see pages 31, 33, 35, and 37 which are ambiguous or seem to imply they might be). For example:“The MoFuSS model focuses primarily on residential woodfuel demand. In some countries, there may be industrial or commercial use of wood that affects tree cover. We do not include these sources of demand for three reasons” (p. 6, p. 25)“To accommodate these changes, we generated 267 million accessibility maps needed to account for changing population distribution using self-collected and commercial woodfuels across SSA between 2010 and 2050” (p. 31) | Incorporate commercial fuelwood use and/or change the language referring to commercial fuelwood use throughout to eliminate ambiguity.Proposed text: “The MoFuSS model has been revised to include the effects of commercial woodfuel harvesting on fNRB calculations.” |  |
| **6** | **Page 6** |  | **te** | Does this model account for the anticipated expansion of road networks in the future? Road expansion is likely to significantly improve access to currently difficult-to-reach sites, reducing the friction values and resulting in higher rates of harvesting further from rural areas. | Proposed text: “The MoFuSS model has been revised to include estimates of road network expansion, taking into account the increased ease of access in formerly hard-to-reach areas.” |  |
| **7** | **Pages 36-48** |  | **ge** | Given the comments detailed above, it would be good to extend the comment period on this model and to give the MoFuSS team an extension to incorporate comments and re-run fNRB values before new fNRB values are accepted as final. | Proposed text: “The MoFuSS team strongly considered and incorporated comments received during the extended comment period (through January 26th, 2024). After incorporating the following comments (explain), the model was re-run, generating the following fNRB values….” |  |
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