**TABLE FOR COMMENTS**

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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** | **-** | **-** | **ge** | We sincerely thank Adrian Ghilardi, Rob Bailis & the whole research team for their commendable work on the evolving fNRB for Sub-Sharan countries using the MoFuSS simulation tool. UpEnergy Group, being a high integrity carbon project developer would like to utilize such scientific advancement for realistic estimation of carbon emissions reductions for creating a meaningful climate and social impact. Our special thanks to UNFCCC for initiating such study for the benefit of carbon project developers and like-minded climate mitigation professionals. | A training session would be more helpful for ease of adoption and utilization of the MoFuSS tool to enable the project developers to use their region-specific survey results to run the simulations and visualize the impact created by their emission reduction projects in their targeted geographical boundaries to achieve the real usefulness of this scientific tool. Requesting UNFCCC and the lead researchers to organize a comprehensive workshop for the project developers to impart the technical know-how of the MoFuSS tool. |  |
| **2** | **-** | **-** | **ge** | **Extension of Public Commenting Period**  The information note has been published on 06 October 2023 and the stakeholders are allowed to share the views and feedback on the note and the related research work till 10 November 2023. We strongly feel that this timeline is inadequate to review, comprehend, analyse and opine, considering the huge efforts and information which has gone into to the exhaustive research work. | We would recommend to extend the timeline for the stakeholder consultation process to enable participation of boarder audience including Project Developers, Host Counties, Governmental bodies, Academicians, NGOs etc.  Proposed text:  *“With the widespread request from the stakeholders, the committee will extend the deadline for commenting on fNRB information note from 10 November 2023 to 31 December 2023”* |  |
| **3** | **Appendix 2.**  **Page No – 22/67**  **Para No - 1** | **7** | **Te** | **Biomass Growth Functions**  This research work sources biomass growth rates from the IPCC’s 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories to estimate the annual biomass growth potential. As per IPCC, the forests are categorized into 3 heads considering their age viz., Primary, Secondary >20 years and Secondary ≤ 20 years and their respective growth rates were published for various ecological zones. The Table 4.12 of 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories (Volume 4: Agriculture, Forestry and Other Land Use)[[1]](#footnote-1) enumerates the aboveground net biomass growth rate for these 3 age categories, wherein the growth rate for Secondary Forest ≤ 20 years will be always much higher than of Primary Forest and Secondary Forest >20 years. To our surprise, the research work only considers growth rate of Secondary Forest ≤ 20 years to source the rmax to calculate the biomass availability (supply). This arises the following questions,   1. Does this assumption not inflate the growth potential and availability of renewable biomass and provide us a false indication rate of forest depletion? 2. What is the certainty that only Secondary Forest area ≤ 20 years having higher growth potential only be harvested by the local population, firewood merchants & charcoal producers? 3. If so as the case why is the concept of biomass accessibility functions are integrated in the model? 4. If we assume Primary Forests are mostly protected ones then why the model considers 10% likelihood of wood harvesting within the protected area? 5. Is it not rational to use the specific maximum & average biomass growth factors for the respective age of the forest to get a realistic biomass growth potential? | We would strongly recommend the researchers to use the aboveground net biomass growth rates as defined by the IPCC’s 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories specific to the respective age category of the forest types to determine and to assume the rmax based on the scientific research works to calculate the realistic growth function of the biomass. Also, the split of various forest age categories to be sourced from the host countries and applied in the calculation  Proposed text:  *“Aboveground net biomass growth rate data are provided across three age categories: “< 20 years after disturbance or establishment”, “> 20 years after disturbance or establishment”, and “primary” or mature stands. We use the respective growth rate values and rmax considering the age of the forest cover in order to realistically estimate the biomass availability”* |  |
| **4** | **Appendix 2.**  **Page No –**  **26 to 27/67**  **Para No –**  **1 to 3** | **Whole section** | **Te** | **Quantifying Biomass consumption**  This research work states three different options to estimate the quantity of fuel wood consumed in the residential sectors as indicated below,   * Option 1 - 0.74 tonnes / per capita / year based on mean value of 109 CDM PDDs * Option 2 - 0.30 tonnes / per capita / year based on local studies conducted in Rwanda, Kenya, and Haiti * Option 3 - 0.40 tonnes / per capita / year based on default value recommended by UNFCCC   and finally, the study considers UNFCCC’s default value of 0.40 stating that it is falling in between the first two options.  We have the following concerns on this assumption,   1. There is no rational in selecting the option 3 (0.4 the UNFCCC default), since it is not even a mean value between the upper bound of 0.74 and lower bound of 0.3. It is more or less a lower bound value only. Hence it is not a true representation of wood fuel consumption. 2. Also, what relevance does it make to consider option 2 which quotes a very region-specific studies (only for 3 countries) to estimate the wood fuel consumption value of the entire Sub-Saharan African context? 3. Although the option 1, which sources the woody biomass consumption values from the PDDs registered under CDM is very pragmatic, but going with country specific mean will represent the true fuel consumption rather taking boarder region. 4. Most importantly in option 1, accounting of wood fuel consumption of non-sub-sharan regions like LAC, E Asia & Pacific and South Asia is not of any relevance, since the study only focusses on SSA. Especially consideration of South Asia (0.40) has significantly bought down the mean consumption to 0.74. 5. Finally, as a matter of fact the wood fuel consumption of 0.4 tonnes / capita / annum is a very low estimate and for the very same reason Carbon Project Developers conduct their own country specific study and experienced much higher values in the real scenario, as witnessed in the option 1 of this current research. Also, the wood fuel consumption for cooking application is very geographic specific and will largely vary based on factors like cooking practices, food habits, culture & ethnicity, socio-economic conditions etc.   Hence, we conclude the approach adopted for estimation of wood fuel consumption in residential sector is not a true representation of actual demand scenario. | We strongly recommend the researchers use to most appropriative country specific wood fuel consumption values based on any official statistics or UN data or through localised surveys etc.  Proposed text:  *“The region-specific wood fuel demand is estimated based on the consumption statistics as per any of the reliable sources such as regional study, official statistics, UN data, localized surveys, registered PDD etc.”* |  |
| **5** | **Appendix 2.**  **Page No – 27/67**  **Para No - 3** | **4** | **Te** | **Transparency in Wood to Charcoal conversion ratio**  The study assumes a UNFCCC’s default wood fuel consumption value (0.4/tpc/year) for both Wood & Charcoal households. The MoFuSS model fails to capture the wastage of biomass associated with charcoal manufacturing process. It is to be noted the traditional / inefficient charcoal kilns are very much prevalent in Sub-Sharan countries with the conversion efficiency as low as 9% to 30%[[2]](#footnote-2). The National charcoal survey of Uganda (2015) carried out by Ministry of Energy and Mineral Development (MEMD) calculates average charcoal production efficiency at 12.5%[[3]](#footnote-3) using traditional kiln methods which puts the wood to charcoal conversation ratio at 1:8. While taking these facts into consideration the wood to charcoal conversion ratio will have a considerable impact on fNRB. However, the study lacks transparency in stating the assumptions on the wood to fuel conversion factor. | The study should consider the specific consumption values for wood and charcoal fuels separately and the efficiency loss in charcoal conversions needs to be factored while estimating the biomass demand. If the MoFuSS model already accounts for the charcoal conversion losses, then the conversion efficiency considered needs to be explicitly mentioned in the information note.  Proposed text:  *““The region-specific wood fuel and charcoal demand are estimated based on the consumption statistics as per any of the reliable sources such as regional study, official statistics, UN data, localized surveys, registered PDD etc. The charcoal conversion efficiency is sourced from the relevant scientific studies”* |  |
| **6** | **Para No – 2 & 3**  **Pg No**  **– 25 of 67** | **Whole Para 2 & 3** | **Te** | **Residential and other sectors**  The MoFuSS model in this research does not account for fuel wood consumption for energy applications in non-residential sectors such as commercial, industrial or institutional uses of woody biomass in ovens, boilers etc. and also the commercial woody biomass consumption for non-energy applications (e.g., construction, furniture) are also not been taken into account, thus largely deviating from the CDM tool 30 approach.  Non-accounting of the wood fuel consumption of the commercial sectors would significantly underestimates the biomass harvest (demand). For an instance as per UN’s Energy Statistics Database[[4]](#footnote-4) Nigeria’s fuel wood consumption for energy applications in commercial sectors accounts to 11.3 %; this goes unaccounted in the current MoFuSS model. Kindly note in addition to this, the biomass consumption for non-energy applications such as construction and furniture also needs to be accounted.  It is very unlikely to closely estimate the biomass demand without considering wood consumption for other commercial purposes and on the other hand this research work inflates the biomass growth potential by considering the highest growth rate. | We recommend researchers to include the woody biomass consumption (for both energy and non-energy application) of non-residential sectors as well based on the reliable sources such as UN, FAO for a realistic estimation of biomass harvest in line with CDM tool 30.  Proposed Text  *The MoFuSS model focusses primarily on residential woodfuel demand but it also accounts wood consumption by other sectors for energy applications in non-residential sectors such as commercial, industrial or institutional uses of woody biomass in ovens, boilers etc. and also the Commercial woody biomass consumption for non-energy applications (e.g., construction, furniture) through the reliable sources such as UN, FAO etc.* |  |
| **7** | **Overall Feedback** |  | **ge** | This research work adopts an approach which underestimates the biomass harvest (demand side) by assuming 0.40 tonnes/capita/annum and not accounting the woody biomass consumption of commercial sectors for both energy and non-energy applications. While on the other side, it adopts an aggressive estimation approach for the biomass growth functions and inflates the biomass availability (supply side). This approach appears to be unrealistic, failing to capture the actual supply – demand scenario. Although the emissions can occur in real-time, but it takes years to capture it.  The identified inaccuracies in the MoFuSS model have resulted in lower fNRB values and thus under values the environmental and associated sustainable benefits that are achievable through high integrity community-based carbon projects and will have adverse implications on climate justice and finance for the host countries.  Globally, 2.4 billion rely on polluting cooking fuels and technologies every day[[5]](#footnote-5), representing an urgent environmental, health and socioeconomic crisis. In specific the fNRB value obtained for DRC is 32% and as a matter of fact only 4.3%[[6]](#footnote-6) has access to clean cooking technology and rest 95.7% are depended on biomass fuels. The aforementioned inaccuracies in this fNRB study can potentially evade the carbon finance opportunities to the LDCs in Sub-Saharan Africa, unless market offers a higher carbon price | A rational approach to be adopted for a realistic estimation of biomass supply and demand module and the resultant fNRB values to ensure the viability of high integrity carbon projects. |  |
| **8** | **MoFuSS**  **Model** | **Sub-national fNRB Values** |  | **Questionable sub-national fNRB Values**  This research work has reported lower fNRB for some of the Urban centres like Kampala, which is unrealistic. This might be due to better connectivity assumptions made in the model to the capital cities of the country. But alarmingly low value doesn’t mean there is no need to do any interventions, we see urbanization rate is very high in Africa and the model will have to consider reducing accessibility assumptions. | Recognizing the need for clean cooking and safe water interventions in the urban cities in Africa, we propose to keep a lower fNRB floor considering the model assumptions may lead difficulty in firming up the right values in urban centres. |  |

1. <https://www.ipcc-nggip.iges.or.jp/public/2019rf/pdf/4_Volume4/19R_V4_Ch04_Forest%20Land.pdf> [↑](#footnote-ref-1)
2. https://www.sciencedirect.com/science/article/pii/S2452292922000091 [↑](#footnote-ref-2)
3. https://pfccparliament.go.ug/wp-content/uploads/2019/04/NationalCharcoalSurvey\_FINAL.pdf [↑](#footnote-ref-3)
4. http://data.un.org/Data.aspx?d=EDATA&f=cmID%3AFW\ [↑](#footnote-ref-4)
5. <https://www.who.int/news-room/fact-sheets/detail/household-air-pollution-and-health> [↑](#footnote-ref-5)
6. <https://www.who.int/data/gho/data/themes/air-pollution/household-air-pollution> [↑](#footnote-ref-6)