Template for comments

Date:	Document:

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

1	3.1	7	ed	Globally, 2.4 billion rely on polluting cooking fuels and technologies, representing an urgent environmental, health and socioeconomic crisis. Emissions from burning wood fuels account for 3% of global emissions, akin to the impact of the aviation industry. Achieving universal access to clean cooking by 2030 will require an estimated $8-10 billion annually. Current commitments stand at a mere $130 million each year. While clean cooking projects have helped millions gain access to clean cooking fuels and technologies in the past decade, the absolute number of people without access to clean cooking is outpacing the rate of growth. Carbon market funding has proven essential for scaling access to clean cooking, especially to poor, rural households in Sub-Saharan Africa and Southeast Asia. We commend Bailis et al. for their impressive effort in establishing new defaults for the fraction of non-renewable biomass (fNRB) in 43 countries in Sub-Saharan Africa. However, we must ensure that a greater sophistication in statistical modelling is matched with the most relevant local data inputs, including satellite technology and ground-sourced data. Globally, the data gaps for fNRB calculations are wide, and we call on host country governments, researchers, and funders to take up this challenge. Key general points from the project developer perspective include: - **Standardising fNRB approaches:** The UNFCCC and the Clean Cooking Alliance's 4C consortium are developing a new methodology for cookstove carbon projects. We call on the key registries and standards bodies to work together to align on guidelines for the application of new fNRB defaults, and a unified approach for existing projects and credits that use TOOL 30. - **Engaging host country governments:** Now more than ever, there is a need for good local data inputs into forest cover change, under the canopy forest degradation from wood collection, and fuel demand for cooking. We commend initiatives like those from the Government of Ghana to commission more research to generate the best data inputs for the MoFUSS model. Moving forwards, host country	Editorial Comment (no proposed changes to Information Note)	

				governments should be consulted as experts in their own local contexts. - **Peer-reviewing data inputs and assumptions:** Although the MoFUSS tool has been peer-reviewed, any model is only as good as the data inputs. There is a need for a thorough interrogation of the latest data sets and assumptions used to calculate these defaults. To ensure best practice, we recommend a full peer-review before new fNRB values are implemented. - **Towards higher integrity:** As an industry, we support the move towards higher integrity across the carbon markets. Greater confidence in accurate, locally relevant fNRB values could translate into higher prices for cookstove and clean cooking fuel carbon credits. - **Avoiding carbon tunnel vision:** While lower fNRB numbers may provide buyers with greater certainty that 1 ton = 1 ton, we caution against carbon tunnel vision. The fNRB calculation gives equal value to carbon stored in old growth rainforest and the carbon stored in fast-growing saplings. By only assessing the net biomass in a landscape, we risk underfunding projects that protect old forests, valuable trees, and preserve biodiversity. In a world that has already reached 1.2 degrees of heating, and with no credible pathway to the 1.5 degrees Paris target, we question the logic of deeming *any* use of fuelwood for cooking as “sustainable” or “renewable.” - **Keeping sight of the impact:** Achieving universal access to clean cooking – will require funding and cooperation on a major scale. Carbon markets were established to promote sustainable development, in addition to reducing greenhouse gas emissions. Given the proven SDG benefits of clean cooking, we call on the global community to ensure that sufficient funding remains available for high-impact cookstove projects, best in class technologies, and fuel transition programmes. All families deserve access to safe, clean cooking.		

2	Paragraph 1 Paragraph 2	1 1	ge	The MoFuSS tool, estimates non-renewable biomass primarily as a function of population data and estimated fuel consumption metrics. Notably, the use of default wood fuel consumption of 0.4 tonnes per capita per year, as homogenized estimation of wood fuel demand across the continent. The tool also relies on 2018 UN data for demographic distribution, which is not an accurate representation of demographic data 5 years since, and which lacks specificity in sub national geographical data. An opportunity here exists for Host Countries to provide more accurate demographic and biomass consumption data as both variables are tracked to varied degrees in most Host Countries DHS and Census survey data. Host Countries should also provide data on forestry biomass stocks. Host Countries maintain data on protected and non-protected forest biomass depletion and regrowth rates over a long time period which should be incorporated into the modelling of renewable biomass using the MoFuSS tool. Host Countries are primarily tasked with the protection of these biomass stocks and should be able to provide meaningful contributions to their estimations and contributions to national and regional fNRB estimates. We implore the CDM MP & EB to consult directly with Host Countries and afford Host Countries and Project developers the option to use nationally approved data sets to augment or supersede the MoFuSS data models where applicable	Proposed text: *The CDM MP shall consult directly with Host Countries on the estimation of demographic and wood fuel consumption data, forestry data and charcoal supply chain data.* Proposed text: *The quantification of demographic and wood fuel consumption data can be sourced from updated Host Country approved DHS or Census data.*	
3	3.1	3	ed	The CDM EB is requested to consider revising its approach to account for the full carbon benefits of avoided biomass consumption from clean cooking and water purification. At present, the methodologies compute emissions reductions from avoided non-renewable biomass consumption, but this misses the sequestration potential of standing biomass, and thus is an underestimation of the climate benefits. In the case of a clean cooking project activity with an established fNRB rate of 0.4: - 40% of the woody biomass avoided (as a function of reduced woody biomass consumption in the project scenario) is non-renewable, as such, emissions reductions are computed as a	Editorial Comment (no proposed changes to Information Note)	

				function of the GHG avoided from the combustion of the non-renewable biomass. - 60% of the woody biomass is renewable, but because this biomass consumption is avoided, it creates some amount of tree growth above the baseline. These are sequestered emissions which cannot be accounted for in any of the published and approved emissions reductions methodologies for clean cooking and water purification projects. The missing function for which the CDM MP is requested to provide guidance here is a principle where the harvesting of the “renewable” portion of woody biomass prevents the storage of additional carbon. If this renewable portion was not cut down at all, then trees would grow at above replacement rate (instead of just regrowing at exactly replacement rate, i.e., “renewal” rate), creating additional carbon sequestration. This would mean additional limb growth, or in some cases additional trees growing.		
4	3.1 And Appendix 1	5 & 6	te	The use of artificially low fNRB values as a corrective measure to ensure conservativeness does not guarantee the ‘integrity’ of a carbon offset. Integrity must be measured based on the accuracy of a project activity’s emissions reductions claims. A clear example of this, was the hitherto approved 0.3 “global default” fNRB value. Based on the latest CDM MP Information Note, this default was not an accurate assessment of this parameter value at the project level, as 24 of the 43 the Countries assessed using the latest MoFuSS tool, had national defaults greater than the default previously prescribed, with some markets at double the default prescribed.	Proposed text: *Appendix 1. Values for fraction of non-renewable biomass* *1. Country-level* *35. Tables 1 below provides preliminary results of the fNRB values at the country level for 43* *countries in Sub-Saharan Africa will only be applicable for use upon a complete validation and verification of the MoFuSS tool and the data sets that support it*	
5	3.2	10	ge	The Information Note states that the model was run for 43 countries in Sub-Saharan Africa. Can the MP confirm if there any timelines when the fNRB value for the remaining countries/regions will be available?	(Request for information – no proposed amendment)	

6	3.2	11 (c)	te	The Information note claims in paragraph 11(c) that TOOL30 only considers accessibility by excluding protected areas from consideration of biomass supply noting that the MoFuSS model also accounts for protected areas but goes further by considering physical accessibility based on topographical features and the effort that woodfuel users must expend to access sources of woody biomass. ALLCOT differs from this position, noting that TOOL30 does define geographically remote areas as non-accessible as well. These are based on proximity to roads and rivers: where the distance is beyond the average distance travelled to collect fuelwood (based on national studies, peer-reviewed literature, or surveys in the project area). The MoFuSS approach of using travel "friction" maps is good but does not consider the national-level behavioural information to determine the threshold of distance travelled to collect fuelwood. Accessibility ALLCOT further notes that the UNEP and the AU have assessed many countries in sub-Saharan Africa and found that the average time spend collecting fuelwood is less than 3 hours, with wide variation between countries (https://wedocs.unep.org/20.500.11822/28515). In contrast, the MoFuSS approach effectively assumes a 24-hour woodfuel collection threshold (https://www.nature.com/articles/nclimate2491), which significantly increases the "accessible" area and dilutes the impact of unsustainable consumption by spreading it evenly across an unrealistically large extent of the forests, resulting in a much lower fNRB estimate.	Editorial Comment: *ALLCOT wishes to clarify how the CDM MP will resolve these contrarian positions in the time spent collecting fuel wood and its subsequent implications on fNRB computations.*	
7	3.2.1 And Appendix Page 19	13	te/ed	We note that the model uses biomass data from 2010, and then forecasts biomass growth from there. At present there does not appear to be any cross-reference to current satellite or LIDAR data to validate the growth models.	Editorial Comment: *We recommend the 2010 data sets and assumptions are validated prior to adoption of the new national and sub national default in Appendix 1.*	
8	3.2.1	13	ge	Some of the data sets used in the estimation of biomass stocks have not yet been validated. Referencing the Information Note:	Editorial Comment:	

				"The maps vary in year and uncertainty, as well as the heterogeneity of data quality (e.g., some maps have been well-validated in moist tropical regions but have greater uncertainty in dry forest regions). The choice of map will lead to different values of initial biomass stock, which can vary widely across different land cover types and sub-national administrative areas." ALLCOT wishes to clarify what if any protocols the CDM EB or MP will employ to validate these data sets prior to the adoption of the set default fNRB estimates. The production of charcoal is an important eco-system service of tropical dry forests and shrublands and any uncertainty in the primary data in these land areas as well as the rates of degradation in these eco systems can have substantive impacts on fNRB computations.	*MP/ External Experts to clarify how data sets will be validated*	
9	3.2.1	13	te/ed	The dataset identified indicates above-ground and below-ground biomass. It should be made clear whether the growth curves and maximum values are based on total above-ground biomass or woody above-ground biomass. The former may lead to some overestimation in grassland ecosystems. If this is already considered, then this needs to be made clearer.	Editorial Comment: MP/ External Experts to *clarify by what means the growth curve and maximum biomass are calculated /what is the total pool they represent. If this is not woody biomass only, then the appropriateness of the dataset may need to be reassessed*	
10	3.2.1	13, 14, 15	te	This section provides less context for forest degradation – e.g., from under the canopy harvesting. It also fails to differentiate the carbon storage potential of new growth trees and saplings vs. old growth trees. Theoretically the model could allow for total denuding of old growth trees in an ecosystem favour of replacement by young saplings or alien invasive species; and still retain the same fNRB. What looks to be a forest from a satellite may actually be a heavily degraded landscape. The model neglects to accurately account for forest degradation. Satellite images may show ground cover but be unable to measure below-canopy degradation. Additionally, they may attribute the same carbon sequestration value to new growth as old growth forests, where this is clearly not the case. Extensive localized harvesting is taking	Proposed Text: *Locally sourced data on a project-basis can inform the degradation of forests caused by wood harvesting*.	

				place can have a significant impact on fNRB which is not accounted for in the model; whereby increasing the uncertainty of the calculations.		
12	3.2.2 & Appendix 2 page 24	16	te	To estimate the quantity of wood and charcoal consumed, the updated default fNRB assessment relies on two simple parameters: - the number of users - the amount of fuel per user. The number of wood and charcoal users is based on (the) WHO's recently updated "Global Household Energy Model", which projects the number and percentage of people using primary household cooking fuels in rural and urban areas of low- and middle-income countries. Note that this assessment considers consumption of primary fuel type only and does not account for the consumption of secondary fuels (e.g., wood and charcoal). This represents a potentially significant under-estimation of the domestic biomass consumption. Households will typically use multiple fuel types in the baseline scenario (wood and / or charcoal), as stacking is widely researched concern in the clean cooking industry. Biomass demand was modelled using the default value currently recommended by the UNFCCC for wood fuel projects, which is 0.4 tons of wood per capita. Assuming a global default of 0.4 tons of wood per capita is a blunt tool – project developers conduct far more rigorous assessments of fuel use at the household level in their baseline assessments. In ALLCOT´s projects we have found that in Senegal the baseline consumption is minimum 0.9 tonnes of wood per capita and in Ivory Coast 1.2 tonnes tonnes per capita per year. In addition, note that the default value applied is less than the Sub-Saharan Africa ("SSA") reported value of 0.87 tons of wood per capita (determined via a cross section of registered CDM PDDs) and 0.59 tons of wood per capita from the UN & national Demographic and Health Surveys (DHS). ALLCOT also notes that the use of default per capita wood consumption rates also implies a homogeneity in wood and charcoal demand profiles across countries and regions. This is conservative, but potentially inaccurate, often as a function of the wide heterogeneity	Proposed text: *Project developers should be allowed to employ more accurate, localized project-level assessments, or regional or sub national wood fuel consumption values of biomass fuel use. These could be sourced from host country governments or from verified project data to inform the fNRB calculations for their project area. Baseline assessments of fuel use can be utilized in the calculations to improve accuracy, including accounting for consumption of secondary fuels.*	

				in cooking practices in rural and urban areas and household sizes. Thus, some clarifications are requested: Are project developers allowed to use regional or sub national wood fuel consumption values, determined using approved CDM or voluntary carbon registry (i.e., Gold Standard, VERRA etc.) methodologies for the estimation of biomass consumption in the computation of fNRB? ALLCOT notes that the current iteration of the MoFuSS tool does not allow for this (datasets outside those built in the current version of MoFuSS) but subsequent iterations will. As such we seek clarification on how assessed values can be applied and what, if any, cross-checks will be required for the project developers to prove against the set default values applied in the information note, and timelines. It is unclear how charcoal demand is modelled, and what, if any wood to charcoal conversion factors have been applied		
13	3.2.2	17	te	The model focuses primarily on residential wood fuel demand and does not count wood harvesting for any other purpose (i.e., commercial energy and non-energy biomass consumption – e.g., beer brewing, shea butter, tobacco curing, fish smoking). The note indicates that industrial roundwood has been omitted because it contributes to <10% of wood demand in most cases. The impact on the fNRB value this omission makes needs to be presented, as that without showing the impact, it may be interpreted as a considerable omission. In addition, the FAO dataset is global and so it fits within the generalised approach taken in this study.	Proposed Text: *The model can be modified to include alternative sources of demand*	
14	3.2.2	18	te	[See comment 6 above] We seek clarification on the accessibility modelling for wood collection		
15	3.2.2	18	te	The MoFuSS tool's correlation between population densities and wood fuel consumption rates for wood consumption presents fewer uncertainties, as most wood is consumed within few kilometers of a household's geographical location in many rural demographics. However, as charcoal is often sourced from further afield and across boundaries, the application of sub-national default values is more obscure.	Editorial Comment: *The CDM EB is requested to provide guidance on a mechanism to allow for variable accessibility rates dependent on project-specific conditions and*	

				The MoFuSS tool attempts to solve this problem by using “Friction” maps. The friction maps represent the effort that wood consumers must expend to travel to a given supply area. The limitation to this approach is that charcoal manufacture & transportation is largely illegal or unregulated with little to no data available. ALLCOT seeks clarity on the weights placed for friction maps for charcoal consumption between national and sub national boundaries on road networks. This limitation was also recognized in the information note as follows: “The MoFuSS model can accommodate transnational trade; however, it is difficult to model because there is no reliable data to verify the results. In addition, for this analysis, Africa was divided into four sub-regions (East, Central, Southern and West) to reduce the computing time necessary for each modelling run. Thus, while transborder trade could occur between countries within each region, it could not occur between countries in separate regions, even if they share a common border.” It is also unclear how the MoFuSS model accounts for changing national policy and regulatory changes in modelling near and short-term biomass consumption trends. Charcoal regulations, in Kenya for example, have had two significant changes to the value systems based on the Forest Regulations of 2009 and the illegal harvest ban of 2017. These policies had dramatic impacts on charcoal production and consumption patterns in Kenya and her neighboring countries. ALLCOT requires clarification on how the policy changes have been modelled to impact in the business-as-usual wood fuel consumption model or the other scenarios that the MoFuSS tool employs.	*adjust calculations for different fuel types; e.g. charcoal vs. wood.* *In particular, we seek guidance on how sub-national fNRB numbers can be applied to charcoal projects, given charcoal is sourced remotely from the location of households / project interventions.*	
16	3.2.3	19	ge	The broad assumption of 70% of deforestation by-products being used for wood fuel needs to be further substantiated in the report.	Editorial Comment: *Please provide logical reasoning to the choice of this assumption.*	
17	3.2.3	21	ge	Previous modelling by the same authors, suggested that the fNRB for the Caprivi Strip in Namibia has an fNRB of 83.1%. The only factor that distinguishes this area from neighbouring regions in Zambia (Western) 33% and Botswana (Chobe) 45.3% and Botswana (Ngamiland) 47%	Proposed text: *Project developers can assess (during the*	

				is the fact that it is enclosed by national boundaries. So, the authors' own studies acknowledge that, where wood fuel collection is localized (here limited supposedly only by national borders), high levels of fNRB are possible in line with many TOOL30 assessments. As project developers operating in these regions, we do not see the wood collection behaviour of villages in the Caprivi Strip to be any different to neighbouring villages in Zambia or Botswana. The national boundary is artificial in this context, as households fuel collection habits mean that they simply collect wood fuel from the nearest available location. So, villages in Zambia do not travel excessive distances to collect wood fuel, they simply obtain the closest available fuel. This practice is inherently unsustainable and leads to very high localized levels of fNRB in collected fuel on both sides of the border.	*baseline/ex-ante stage) the accessibility of biomass and how biomass is harvested to improve accuracy of the fNRB in harvested biomass. This can be based on assessments of how far households must travel to collect wood fuel, for example.*	
18	3.2.3	21	ge	At present the computational power required for the MoFUSS model is too great to run the whole of Sub-Saharan Africa together. Instead, the numbers presented represent Sub-Saharan Africa run in four segments. This creates artificially high fNRB values in Rwanda and Burundi as the model is currently unable to account for cross-border trade with the DRC.	Editorial Comment: *We recommend the model is run with all Sub-Saharan Africa in one unit to properly account for cross-border trade.*	
19	3.3	28	ge	Understanding the high variability of fNRB is crucial in its assessment. The authors rightly state that "countries have sub-national units with large differences in population density and accessibility. So, we see high NRB in close proximity to populated regions and low NRB in the unpopulated regions." This potential for high-levels of fNRB close to populated human habitation is not accurately captured in the modelling and can only be achieved via localized, project-level assessments.	Proposed text: *It should be recognized that the inherent variability of fNRB is not represented by the model, and that project-level studies can increase the accuracy of the calculation. Therefore, there should be flexibility in the way that Project Developers can calculate project-specific fNRB rates that captures this variability more effectively using localized data on biomass fuel use and harvesting*	

20	Appendix 2, page 26	Quantifying Consumption	te	It is noted that Latin American countries vary dramatically in average annual consumption of woody biomass per person vs other areas of the world. Applying an average to the simulation unfairly punishes Latin American countries.	Proposed text: *Guidance shall be provided to developers on how to incorporate variability in annual consumption of woody biomass per person*.	
21	Appendix 2, page 36	Paragraph 5 Use of deforestation by products	te	The model can simulate future tree cover loss that might be caused by drivers unrelated to wood fuel demand, such as agricultural expansion. It can be assumed that if wood fuel is generated by agricultural expansion, it eliminates gathering of wood Fuel in other reachable harvesting areas. Agricultural expansion that delivers wood fuel for consumption should contribute to non-renewability.	Proposed Text: *Guidance shall be provided to developers on how to incorporate wood fuel from agricultural areas in the non-renewability category.*	
22	Appendix 2, page 37	Paragraph 1	Te/ed	For this assessment, friction was increased by 90% which means that the likelihood of wood harvesting from protected areas was only 10% that of unprotected areas with similar terrain. Nevertheless, harvesting of woodfuel from protected areas is much higher than this assumption.	Editorial Comment: *Review "friction factor," all protected areas are not equally difficult to access for both self-collection and commercial extraction.* Proposed text: *We will review harvesting of woodfuel from protected areas.*	
23	Appendix 2, page 38	Paragraph 3	te	The provided Google Drive for the fNRB numbers has 6 different scenarios that can be broken down into two main categories: Based on interventions Business as Usual vs After Intervention. Why are the numbers having significant differences & can this change if the model is fed with alternative data (up to date)? How does increasing the forecasting period affect the model output performance?	Proposed text *The tool and methodology should be designed to allow for the incorporation of alternative data sources. Input parameters should be made easily available for review.* *The model/ tool should have an assessment metric for tracking the effect of*	

					increasing or reducing the forecast period.	
24	Entire document	-	te	The MoFuSS model is a complex system requiring numerous spatial inputs, each characterized by varying resolutions, each contributing its unique level of uncertainty. Further complexity arises from the need for resolution adjustments. Furthermore, understanding the potential relationships among these inputs is crucial to minimize variations in estimations. Unfortunately, the report does not include an assessment of collinearity among the input variables to determine their interdependencies. Certain MoFuSS model inputs, such as population distribution and aboveground biomass, are derived from predicted data. Using estimated or projected data introduces notable disparities compared to the use of published data. The inherent uncertainties in the estimation model can lead to inaccuracies, potentially impacting fNRB estimation. In contrast, the utilization of published data helps mitigate these uncertainties. Assumptions regarding input data for future estimations can introduce uncertainties. For instance, assuming that rural and urban areas change only in size and not in spatial distribution over time or that the percentages of fuelwood users remain constant over time can affect future predictions of population and consumption patterns.	The document should include a description of any required resolution adjustments and related assumptions. Additionally, it is advisable to conduct a collinearity assessment of the input variables to ascertain potential relationships among them. This assessment can significantly aid in reducing variations in AGB, consumption, and fNRB estimates. The report should feature a dedicated section outlining the results, conclusions, and practical applications of the collinearity assessment. Furthermore, for inputs derived from estimations or predictions, a process of verification is essential. Descriptions of the verification methods and the resulting accuracy of the data should be included in the report. Moreover, it is important to establish justifiable assumptions regarding changes in population and	

					consumption dynamics over time to improve the robustness of future predictions.	
25	Biomass stocks p. 19	Entire section	te	The 2010 above-ground biomass (AGB) maps utilized as baseline input for the fNRB calculations require a verification and validation process to establish their accuracy. These 2010 AGB maps served as the foundation for estimating future AGB levels up to the year 2050 through the application of growth and harvest functions. The reliability of these future estimations is dependent on the accuracy of the baseline AGB data. Potential inaccuracies in the baseline AGB data can lead to inaccuracies in the future estimations. Furthermore, the main document does not provide information about the model accuracy associated with the future AGB estimates, nor does it suggest any background reading for such details. While the researchers express their intentions to refine AGB estimations in future work, the current estimates may potentially contain inaccuracies that could have an impact on the fNRB assessments.	A validation and verification assessment of the 2010 baseline AGB maps sourced from WCMC should be carried out. The report should incorporate a dedicated section discussing the accuracy of these AGB maps. Furthermore, it is essential to provide information on the model accuracy employed in predicting future AGB values in the report. This will enhance the transparency and reliability of the fNRB assessments.	
26	Biomass growth functions p. 21	Entire section	te	A growth function is applied to the 2010 AGB to estimate biomass growth from 2010 to 2050. This function relies on current AGB, maximum growth rate (rmax), and maximum woody biomass (K). As previously mentioned, the inaccuracy of the 2010 AGB data has the potential to affect these calculations. Furthermore, the maximum AGB stock values used in the growth function are sourced from the 2010 WCMC maps. While a study has been conducted to provide standard deviations of the rmax and K values for different land cover classes to mitigate variation, using the maximum growth rate for corresponding land cover and ecological zones may lead to overestimations of biomass growth. The source and accuracy of the growth function are not reported in the document, highlighting the need for validation and verification.	The previously mentioned assessment for validating and verifying the AGB maps is crucial not only for the AGB but also for the accurate estimation of maximum AGB stock. Moreover, utilizing total, primary, and tree cover gain data to estimate the portion of stand aged below and above 20 years and applying the corresponding growth rate values for	

				Additionally, a sensitivity analysis of the fNRB to the rmax and K values was conducted as part of the study, revealing high sensitivity. Consequently, uncertainties originating from these inputs can significantly impact the fNRB estimations.	different stand ages can enhance the accuracy of growth estimations. It is imperative to conduct an assessment for validating and verifying the growth function, and the report should encompass a dedicated section addressing the accuracy of this function. This will bolster the reliability of the entire estimation process.	
27	Biomass harvest and NRB in MoFuSS p. 35	Entire section	te	A harvest function is employed to estimate biomass harvest from 2010 to 2050, which considers a pressure index, consumption, and wood fuel generated as by-products from deforestation. However, the report lacks detailed information on how the pressure index is determined. Consequently, an understanding of the inclusion of the friction factor and related assumptions, which are calculated from distance and elevation to estimate accessibility, is missing. Furthermore, the accuracy of the harvest function is not reported in the document. Therefore, the model necessitates validation and verification to ensure the reliability of its results.	The report should incorporate a description of the calculation of the pressure index and the friction factor, along with an explanation of the relationship between these elements. Additionally, it is crucial to provide justification for the assumptions and methods employed in determining the friction factors. Furthermore, an assessment for validating and verifying the harvest function should be conducted, and the report should include a dedicated section addressing the accuracy and reliability of this function. This step will enhance the overall	

					credibility of the model's results.	