

**Review Form 3**

Journal Name:	<a href="#">International Journal of Environment and Climate Change</a>
Manuscript Number:	Ms_IJECC_124774
Title of the Manuscript:	Assessment of carbon sequestration and plant diversity in cocoa agrosystems in the Man region, Côte d'Ivoire
Type of the Article	Original Research Article

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**PART 1: Review Comments**

<b>Compulsory</b> REVISION comments	Reviewer's comment	Author's Feedback <i>(Please correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)</i>
<p><b>Please write a few sentences regarding the importance of this manuscript for the scientific community. Why do you like (or dislike) this manuscript? A minimum of 3-4 sentences may be required for this part.</b></p>	<p>This manuscript makes a valuable contribution to the scientific community by addressing a critical topic at the intersection of agroforestry, biodiversity conservation, and climate change mitigation. By assessing the carbon sequestration potential and plant diversity within cocoa agroforestry systems in Côte d'Ivoire, the study provides essential insights into how agricultural practices can simultaneously enhance productivity and environmental sustainability. The rigorous methodology and focus on both young and mature plantations offer a nuanced understanding of how species diversity and plantation management influence carbon storage over time.</p> <p>However, the manuscript could benefit from more detailed justifications for site selection and plot size, as well as additional citations to support key claims. Despite these minor gaps, the research holds significant relevance for policymakers and practitioners seeking sustainable land-use strategies in tropical agriculture, making it a valuable addition to current agroforestry literature. Overall, I find the manuscript highly informative and timely for global environmental challenges.</p>	
<p><b>Is the title of the article suitable? (If not please suggest an alternative title)</b></p>	<p>The current title, "<b>Assessment of Carbon Sequestration and Plant Diversity in Cocoa Agrosystems in the Man Region, Côte d'Ivoire</b>," is generally suitable as it accurately reflects the core focus of the study—carbon sequestration and plant diversity in cocoa agroforestry systems. However, it could be made slightly more specific or engaging by emphasizing the dual focus on agroforestry and sustainability. For this, an alternative title could be: "<b>Evaluating Carbon Sequestration and Biodiversity in Cocoa Agroforestry Systems: A Case Study from the Man Region, Côte d'Ivoire</b>." This alternative highlights the evaluation aspect and connects the findings to agroforestry systems more explicitly, while maintaining the focus on both carbon and biodiversity.</p>	
<p><b>Is the abstract of the article comprehensive? Do you suggest the addition (or deletion) of some points in this section? Please write your suggestions here.</b></p>	<p>The abstract provides a clear overview of the study, including its aims, methodology, results, and conclusions, making it generally comprehensive. However, there are a few areas where the abstract could be improved:</p> <ol style="list-style-type: none"> <li><b>More Specific Information on Methodology:</b> While the abstract mentions the use of botanical inventories and measurements, it could briefly mention the total number of plots sampled and the specific carbon sequestration calculation methods (such as allometric equations). This would give readers a clearer sense of the study's scale and rigor.</li> <li><b>Key Findings:</b> The abstract mentions a lack of significant differences in carbon sequestration between plantation age groups, but it would be helpful to add a specific numeric range or key findings regarding carbon stock and species diversity. This will give the reader a better understanding of the quantitative outcomes.</li> <li><b>Practical Implications:</b> Including a brief mention of the practical implications for policymakers or cocoa farmers (e.g., optimizing plantation management for carbon sequestration and biodiversity) would increase the relevance of the study.</li> </ol> <p><b>Suggested Deletions:</b></p> <ul style="list-style-type: none"> <li>There are no points that need to be deleted, but some sentences could be condensed to make room for the suggested additions without making the abstract too long.</li> </ul>	
<p><b>Are subsections and structure of the manuscript appropriate?</b></p>	<p>The subsections and structure of the manuscript are generally appropriate, but there are a few areas where improvement could enhance clarity and readability:</p> <p><b>Strengths:</b></p> <ul style="list-style-type: none"> <li>The manuscript follows a logical structure, with clear subsections for <b>Introduction, Materials and Methods, Results, Discussion, and Conclusion</b>. This traditional format works well for</li> </ul>	

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	<p>scientific papers and allows readers to easily follow the progression of the study.</p> <ul style="list-style-type: none"><li>• The <b>Materials and Methods</b> section is divided into data collection and data analysis, which helps in clearly distinguishing the different aspects of the research methodology.</li></ul> <p><b>Areas for Improvement:</b></p> <p>Overall (Author is requested to pay your attention to maintain the weightage of the article)</p> <ul style="list-style-type: none"><li>• <b>Title &amp; Abstract (10-15%):</b> Title (10-20 words), Abstract (150-250 words) summarizing the entire article.</li><li>• <b>Introduction (15-20%):</b> 400-600 words providing background, significance, and objectives of the study.</li><li>• <b>Methods (15-25%):</b> 600-800 words describing experimental setup, data collection, and analysis.</li><li>• <b>Results (15-20%):</b> 500-700 words presenting findings objectively, with use of tables/figures as needed.</li><li>• <b>Discussion (20-25%):</b> 600-900 words interpreting results, discussing implications, limitations, and future research.</li><li>• <b>Conclusion (5-10%):</b> 200-400 words summarizing key findings and their significance.</li><li>• <b>References:</b> No specific word count; usually 20-50 references, depending on the depth of the study.</li><li>• <b>Acknowledgments (optional):</b> 50-100 words acknowledging contributions or funding sources.</li></ul> <p><b>Introduction:</b></p> <p>Your suggestions are thoughtful and would indeed enhance the clarity and depth of the article. Here's how you can fine-tune the feedback:</p> <ul style="list-style-type: none"><li>• <b>Restructure the Introduction:</b> To create a smoother transition, introducing distinct subsections like "Background" and "Objectives" will not only clarify the study's motivation but also make the content more digestible for the target audience. This approach will help differentiate between general information and the specific aims of the study.</li><li>• <b>Clarify the Target Audience:</b> Identifying and addressing specific groups—such as agroforestry practitioners, policymakers, researchers in climate change mitigation, or conservationists—will help tailor the message. The practical implications of cocoa-based agroforestry systems on carbon sequestration and biodiversity conservation might be especially relevant to those working on land use policy and sustainable agriculture.</li><li>• <b>Strengthen the Introduction with Citations:</b> Adding citations to seminal works such as Tschantke et al. (2011) and Wade et al. (2010) would bolster the argument linking cocoa agroforestry with carbon sequestration and biodiversity. This would ground the introduction in well-established scientific literature, enhancing its credibility.</li><li>• <b>Incorporate Additional References:</b> Including more recent studies like Duguma et al. (2019) and Sonwa et al. (2007) would provide a broader context on the ecological benefits of cocoa agroforestry systems. This would give the introduction a more well-rounded perspective, particularly with regard to climate change mitigation and biodiversity conservation efforts.</li></ul> <p><b>Materials and Methods:</b></p> <p>The <b>Data Collection</b> and <b>Data Analysis</b> subsections are useful, but they could benefit from additional <b>Subsections for Study Area:</b> Consider adding subsections like "Study Area Description" and "Sampling Design" to organize the methodology and help readers better navigate the study's context.</p> <ul style="list-style-type: none"><li>• <b>Justification for Site Selection:</b> Could the authors explain the rationale behind choosing specific sites (Gloyogouin, Dakouipleu, Goziogouiné)? Were these locations selected because they are representative of the broader cocoa-growing region in Côte d'Ivoire, or were ecological or socio-economic factors considered?</li><li>• <b>Plot Size Justification:</b> The authors might clarify why they used 10m x 20m plots. Were these</li></ul>	
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	<p>dimensions informed by prior research in similar cocoa ecosystems, or do they reflect unique characteristics of the study plantations?</p> <ul style="list-style-type: none"><li>• <b>Sample Size Rationale:</b> What is the basis for selecting 60 plots? Was this sample size determined by statistical requirements, logistical feasibility, or other factors? How does the sample size relate to the total number of cocoa plantations in the area?</li><li>• <b>Study Region Size and Comparison:</b> Additional details on the total area of the study region and how it compares to the sampled area would be beneficial. This could help clarify the scale of the study and its representativeness.</li><li>• <b>Land Use Description:</b> A more detailed description of the region's land use patterns would be helpful. Is cocoa farming the dominant activity, or are other land uses (e.g., agriculture, forest patches) present that might influence biodiversity and carbon sequestration?</li><li>• <b>Inclusion of Maps:</b> A map showing the national and local context of the study sites would greatly enhance reader understanding. The authors might consider adding one to provide geographical clarity.</li><li>• <b>Data Analysis Clarification:</b> Expanding the data analysis section with more detailed explanations, particularly on the application of allometric equations, would help. A step-by-step outline of how data were analyzed, and why specific methods were chosen, could improve clarity.</li></ul> <p><b>Results and Discussion:</b></p> <ul style="list-style-type: none"><li>• <b>Subheadings in Results:</b> While the Results section is well-organized, incorporating subheadings such as "Carbon Sequestration," "Species Diversity," and "Age-Class Analysis" would enhance readability by clearly delineating the key findings.</li><li>• <b>Discussion Section Subsections:</b> Splitting the Discussion into subsections like "Biodiversity," "Carbon Sequestration," and "Implications of Plantation Age" would improve focus and make the discussion more organized.</li><li>• <b>Clarification on Youngest Plots:</b> The text mentions that the youngest plots (8 to 10 years) are located in Glayogouin, but this information seems absent from the figures. The authors could consider updating the figures to reflect this or adding clarification in the text.</li><li>• <b>Restructure Figures 2, 3, and 4:</b> The figures could benefit from added attributes or more detailed explanations. Enhancing the figure captions or restructuring the visuals to be more self-explanatory would improve clarity.</li><li>• <b>Strata and Tree Density:</b> Could the authors elaborate on how different strata were defined and how the number of trees per hectare was calculated? Clarifying the protocol or guidelines used for stratification would be helpful.</li><li>• <b>Link Between Figures and Text:</b> The relationship between Figures 2, 3, 4, and the findings in the text should be made more explicit. Better connecting these visuals to the discussion on species diversity and carbon sequestration would strengthen the interpretation of the results.</li><li>• <b>Carbon Stock Calculation:</b> Providing more detail on how the carbon stock was calculated would be beneficial. Explaining the methodology in-depth would help ensure readers fully understand the reliability and implications of the carbon sequestration findings.</li></ul> <p><b>Conclusion:</b></p> <ul style="list-style-type: none"><li>• The conclusion is appropriate as a standalone section but could be linked to the practical implications more directly, such as in a "Practical Applications" subsection.</li></ul> <p><b>References:</b></p> <ul style="list-style-type: none"><li>• <b>Could additional citations be included?</b> While the study is well-cited, adding more recent references, especially in the discussion and results sections, could help to further support the findings. Would the authors consider including more studies on carbon sequestration and biodiversity in cocoa agroforestry systems, such as those by Nair et al. (2009) or Mbow et al. (2014)?</li></ul>	
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<p><b>Please write a few sentences regarding the scientific correctness of this manuscript. Why do you think that this manuscript is scientifically robust and technically sound? A minimum of 3-4 sentences may be required for this part.</b></p>	<p>This manuscript is scientifically robust and technically sound due to its comprehensive methodology and adherence to established protocols for carbon sequestration and biodiversity assessments. The use of allometric equations to estimate biomass and carbon stock aligns with internationally recognized standards (such as those from the IPCC), ensuring the accuracy of the results. Additionally, the study's focus on multiple cocoa plantations of different ages provides a representative sample that strengthens the reliability of the findings. The statistical analyses, including the ANOVA test, are appropriate for comparing carbon stock across age groups, further supporting the scientific validity of the results. Overall, the research design and data analysis methods are well-executed, making the manuscript a valuable contribution to the field of agroforestry and climate change mitigation</p>	
<p><b>Are the references sufficient and recent? If you have suggestions of additional references, please mention them in the review form.</b></p> <p>=</p>	<p>The references included in the manuscript are generally relevant, but the list could be strengthened by incorporating more recent and diverse studies, particularly those focused on the relationship between cocoa agroforestry systems, carbon sequestration, and biodiversity. Many of the references are from earlier years, and while they provide a solid foundation, more recent studies would enhance the manuscript's scientific depth and reflect the latest research trends.</p> <p><b>Suggested Additions:</b></p> <ol style="list-style-type: none"><li><b>Recent studies on cocoa agroforestry and carbon sequestration:</b><ul style="list-style-type: none"><li><b>Nair, P.K.R., et al. (2009):</b> "Soil carbon sequestration in tropical agroforestry systems: A feasibility appraisal." <i>Environmental Science &amp; Policy</i>. This study explores carbon sequestration specifically within agroforestry systems, which would complement the manuscript's focus.</li></ul></li><li><b>Research on the biodiversity impact of agroforestry systems:</b><ul style="list-style-type: none"><li><b>Tscharntke, T., et al. (2011):</b> "Multifunctional shade-tree management in tropical agroforestry landscapes." <i>Journal of Applied Ecology</i>. This work discusses biodiversity conservation within agroforestry systems and could strengthen the discussion on species diversity in the manuscript.</li></ul></li><li><b>Studies on cocoa agroforestry in West Africa:</b><ul style="list-style-type: none"><li><b>Wade, A.S.I., et al. (2010):</b> "Management strategies for maximizing carbon storage and tree species diversity in cocoa-growing landscapes." <i>Agriculture, Ecosystems &amp; Environment</i>. This study is directly relevant to the region and context of the manuscript, providing insights into maximizing both carbon sequestration and biodiversity in cocoa plantations.</li></ul></li></ol> <p><b>Conclusion:</b></p> <p>While the references are sufficient, incorporating more recent and region-specific studies would enhance the manuscript's relevance and authority in the field.</p>	

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<p>Minor REVISION comments</p> <p><b>Is the language/English quality of the article suitable for scholarly communications?</b></p>	<p>The language and English quality of the article are generally suitable for scholarly communication, but there are areas where improvement would enhance clarity and readability. The manuscript is mostly clear, but there are occasional instances of awkward phrasing, grammatical errors, and run-on sentences that could confuse readers.</p> <p><b>Suggestions for Improvement:</b></p> <ol style="list-style-type: none"> <li>1. <b>Sentence Structure:</b> Some sentences are too long and complex, which may make it difficult for readers to follow. Breaking these into shorter, more concise sentences would improve flow.</li> <li>2. <b>Technical Terms:</b> While the manuscript uses appropriate technical terminology, some terms could benefit from clearer definitions or context to make them more accessible to a broader audience.</li> <li>3. <b>Proofreading:</b> A thorough proofreading or language editing could address minor grammatical issues, such as subject-verb agreement and punctuation, which will improve the overall readability of the manuscript.</li> </ol>	
<p><b>Optional/General</b> comments</p>	<p>Here are some optional/general comments for the authors to consider:</p> <ol style="list-style-type: none"> <li>1. <b>Contextualization of Findings:</b> While the manuscript presents valuable findings on carbon sequestration and biodiversity in cocoa agroforestry systems, it would benefit from a more extensive discussion on the implications of these results for sustainable agricultural practices. Linking the findings to broader issues, such as climate change adaptation and food security, could enhance the manuscript's relevance.</li> <li>2. <b>Visual Representation:</b> Consider improving the quality and clarity of the figures. Clearer visuals with well-labeled axes and legends would make the data more accessible and impactful for readers. Additionally, including a summary table of key findings may help distill complex information.</li> <li>3. <b>Engagement with Local Communities:</b> It would be beneficial to include a discussion on how the findings can be communicated to local farmers and stakeholders. Engaging with local communities regarding sustainable practices could enhance the practical application of the research.</li> <li>4. <b>Future Research Directions:</b> The manuscript could strengthen its contribution by suggesting specific areas for future research. Identifying gaps or unanswered questions in the field of cocoa agroforestry could help guide subsequent studies and foster ongoing exploration of this important topic.</li> <li>5. <b>Ethical Considerations:</b> If applicable, a brief mention of ethical considerations regarding research conducted in local communities or natural habitats would be valuable, especially in terms of ensuring sustainability and respect for local practices</li> </ol> <p>Based on the review of the manuscript and considering its strengths, weaknesses, and areas for improvement, I would assign an overall mark of 7.5.</p> <p>Rationale:</p> <ul style="list-style-type: none"> <li>• Strengths: The manuscript addresses a relevant topic in agroforestry and climate change, employs a solid methodology, and provides valuable insights into carbon sequestration and biodiversity in cocoa agroforestry systems.</li> <li>• Areas for Improvement: There are some issues with clarity, language quality, and the need for more detailed justifications in the methodology. The references could also be more current, and the discussion could benefit from further exploration of implications and future research directions. Given these factors, a Major Revision would be appropriate to address the identified issues before the manuscript can be considered for publication</li> </ul>	

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**PART 2:**

	<b>Reviewer's comment</b>	<b>Author's comment</b> <i>(if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)</i>
<b>Are there ethical issues in this manuscript?</b>	<i>(If yes, Kindly please write down the ethical issues here in details)</i>	

**Reviewer Details:**

Name:	<b>Chhote Lal Chowdhary</b>
Department, University & Country	<b>Nepal</b>