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A Scientific International Journal on Geotechnique, Construction Materials and Environment

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- Q1. Does the abstract contain "background, methodology, results, and conclusions" within 150 to 250 words? Answer (Yes or No): Yes
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2. Authors' Biography (Please write all authors' full names and biodata here)

I Nengah Sinarta was born in Denpasar, July 2, 1970. In 1996, he received a Bachelor's degree Engineering in Udayana University. Then he received a Master's degree in 2003 and a Doctoral degree in 2018 at the Department of Civil and Environmental Engineering, Faculty of Engineering, Universitas Gadjah Mada, Indonesia. In 1998, joined Warmadewa University. His experiences include research, designing, and education. He also published many papers in National Conferences and National/International Journal, which focus on the field of Civil Engineering, Geotechnical Engineering, landslide hazards, and geological disaster. Mr I Nengah Sinarta joined Indonesia Society for Geotechnical Engineering (ISGE/HATTI)-ID. No.: 15.2223.OR. E-mail: inengahsinarta@gmail.com

Putu Aryastana was born on February 2, 1982, in Buleleng Regency, he successfully completed his undergraduate studies within the Civil Engineering Department at Udayana University in 2004. Subsequently, he pursued a dual Master's program, earning both a Master of Science and a Master of Engineering in 2012. This academic achievement was realized through a collaborative initiative involving the Department of Environmental Science at Udayana University in Indonesia and Yamaguchi University in Japan. Since 2013, he has held a teaching position at Warmadewa University. In addition, he obtained a Ph.D. degree from National Central University in Taiwan, specializing in Environmental Science and Technology program. His professional background encompasses research, design, and educational roles. He has an extensive publication record, contributing to national and international conferences as well as journals. These publications predominantly delve into the domains of civil engineering, remote sensing, environmental science, and water resources management. E-mail: aryastanaputu@gmail.com.

Kadek Windy Candrayana was born in Denpasar on March 14, 1988. He earned a bachelor's degree in civil engineering from Udayana University in 2011 and completed his master's degree in water resources management at the same university in 2018. From 2011 to 2020, he worked as a water resource engineer at a planning consultant before joining Warmadewa University in 2020. His published articles primarily focus on topics related to water resources, floods, and coastal erosion. Email: windy.candrayana@gmail.com

I Ketut Agung Sudewa was born in Buleleng, April 19, 1963. In 1986, he received a Bachelor's degree Agricutural in Udayana University. Then he received a Master's degree in 2009 at the Enviromental Department Faculty of Agricultural, Universitas Udayana, Bali. In 1988., He joined at Faculty of Agriculture Warmadewa University. His experiences include research, designing, and education. He also published many papers in National Conferences and National/International Journal, which focus on the field of Agricultural, and environmental. E-mail: agsudewa63@gmail.com

3. Authors' Contributions (Please write all authors' contributions here)

I Nengah Sinarta: conception, design, acquisition, interpretation of data, and drafting the article. Putu Aryastana: drafting the article, reviewing, and final approval of the version to be submitted. Kadek Windy Candrayana: analysis, interpretation of data, drafting the article, reviewing, and final approval of the version to be submitted. I Ketut Agung Sudewa: analysis, interpretation of data, drafting the article, reviewing, and final approval of the version to be submitted.

4. Ethics (Please provide ethical issues that may arise after the publication of your paper)

This article is original and contains unpublished material. The corresponding author confirms that all of the other authors have read and approved the manuscript and have no ethical issues.

Name of the Journal:

International Journal of GEOMATE

A Scientific International Journal on Geotechnique, Construction Materials and Environment

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INFLUENCE OF GRASS ROOTS ON THE STABILITY OF SLOPES: EXPERIMENTAL MODELLING AND NUMERICAL ANALYSIS

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Name of the author 4: I Ketut Agung Sudewa

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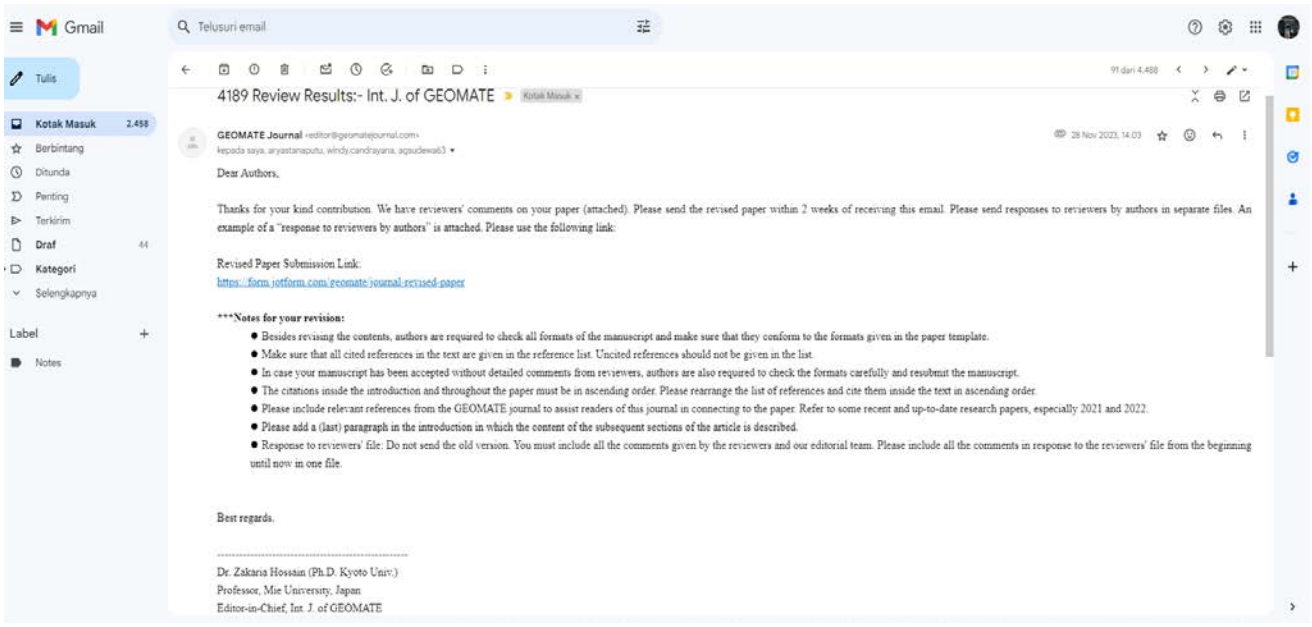

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4189 Review Results:- Int. J. of GEOMATE

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kepada saya, aryastanaputu, windy.candrayana, agusdewa63

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Thanks for your kind contribution. We have reviewers' comments on your paper (attached). Please send the revised paper within 2 weeks of receiving this email. Please send responses to reviewers by authors in separate files. An example of a "response to reviewers by authors" is attached. Please use the following link:

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- In case your manuscript has been accepted without detailed comments from reviewers, authors are also required to check the formats carefully and resubmit the manuscript.
- The citations inside the introduction and throughout the paper must be in ascending order. Please rearrange the list of references and cite them inside the text in ascending order.
- Please include relevant references from the GEOMATE journal to assist readers of this journal in connecting to the paper. Refer to some recent and up-to-date research papers, especially 2021 and 2022.
- Please add a (last) paragraph in the introduction in which the content of the subsequent sections of the article is described.
- Response to reviewers' file: Do not send the old version. You must include all the comments given by the reviewers and our editorial team. Please include all the comments in response to the reviewers' file from the beginning until now in one file.

Best regards,

Dr. Zakaria Hossain (Ph.D. Kyoto Univ.)
Professor, Mie University, Japan
Editor-in-Chief, Int. J. of GEOMATE

Saturday, November 4, 2023

Paper ID number	4189
Paper Title	INFLUENCE OF ELEPHANT GRASS ROOTS AND NUMERICAL ANALYSIS OF VOLCANIC SOIL ON DEBRIS FLOW THREATS
Originality	Good
Quality	Good
Relevance	Good
Presentation	Good
Recommendation	2. Accept with minor revision

General comments

The manuscript is well written and in good arrangement. All Tables and Figures are clear. However, there are some errors that need the authors to conduct amendment.

Mandatory changes

1) For the abstract, did the values of 0.0001m and 0.0000064 m in the statement "Model results after four days, there was a decrease of 0.0001m, and after 33 days, there was a decrease of 0.0000064 m." is referring to the height of the slope, or any? Please clarify what this value means.
2) For Figure 1, please label the left image as (a) and the right image as (b), and update the title of Figure 1 based on (a) and (b). Additionally, the corresponding text needs to be updated as describing in Figure 1(a) or Figure 1(b).
3) For Figure 2, please label the left image as (a) and the right image as (b), and update the caption of Figure 2 based on (a) and (b). Additionally, the corresponding text needs to be updated as describing Figure 2(a) or Figure 2(b).
4) All parameters written in text form should be in italics.
5) On page-6, there are two Table 5.

Sunday, November 26, 2023

Paper ID number	4189
Paper Title	INFLUENCE OF ELEPHANT GRASS ROOTS AND NUMERICAL ANALYSIS OF VOLCANIC SOIL ON DEBRIS FLOW THREATS
Originality	Good
Quality	Average
Relevance	Good
Presentation	Good
Recommendation	2. Accept with minor revision

Mandatory changes

Introduction
1. The sources in the Introduction are adjusted to the References which are sorted alphabetically
2. Reference is sorted alphabetically
3. Reference number 21 is not found in the sentence
4. Add previous research which is stated that the elephant grass had been increase soil strength against landslides-reducing soil erosion (to show differences/support against to this research)
5. Which place is referred to in the sentence "several places" in Bali prone to landslides have tried to plant vetiver grass for water conservation and slope stabilization?

Research Significance
1. Provide a basic theory/reference for the consideration/selection of the use of land in aged of 4 days and 33 days.

3.2 Rainfall analysis
1. Table 1 is replaced with rainfall data from 2012 - 2021 (ten years) and directly lists the results from the Pearson Type III Log at 25 years return period (as 69.76 mm). There is no need to include Log Normal and Gumbel data, unless you want to calculate/compare based on 3 rainfall data from these 3 methods.
2. How many millimeter of rain data occurred in 2020? (This rainfall was chosen because it is close to the rainfall value at the time of the landslide in 2020).

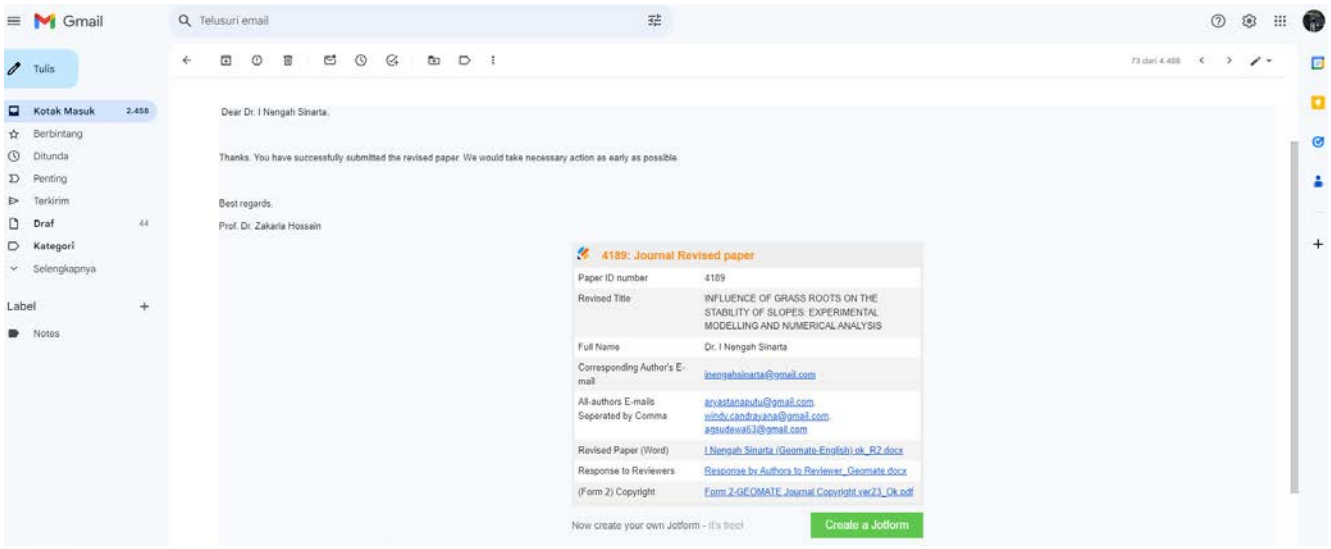
Give sources for each figure and table.

Paper ID number	4189
Paper Title	INFLUENCE OF ELEPHANT GRASS ROOTS AND NUMERICAL ANALYSIS OF VOLCANIC SOIL ON DEBRIS FLOW THREATS
Originality	Average
Quality	Average
Relevance	Average
Presentation	Average
Recommendation	2. Accept with minor revision

Mandatory changes

The paper investigates the influence of elephant grass roots and the numerical analysis of volcanic soil on debris flow threats. The research focused on the stability behavior of volcanic soil in Bali, Indonesia, under conditions of high rainfall and surface erosion. Using Plaxis 3D software for numerical analysis, the study evaluated soil stability in a test box with elephant grass and vetiver to determine slope stability. The findings showed that without vegetation, volcanic soil exhibited a soil tension of 0.6854 kN/m² and a low safety factor, indicating landslide threats. However, adding elephant grass combined with vetiver grass significantly reduced erosion (94.6% on a 45° slope and 92.67% on a 60° slope) and increased runoff effectiveness (55.48% on a 45° slope and 53.89% on a 60° slope). The study concluded that this combination of grasses effectively mitigates soil erosion and landslide risks in volcanic soils.
My comments on this work are as follows:
The title of the paper does not read well. I suggest: "Influence of grass roots on the stability of slopes: experimental modelling and numerical analysis" or something similar to this.
A discussion on long-term performance of the grass planting on soil stability is required. This will provide a more comprehensive evaluation of the effectiveness and sustainability of the proposed solution.
The authors have used Plaxis software for their analysis, which is based on the finite element method. However, debris flow often involve large deformations, hence other numerical techniques may be more suitable for modelling this problem. I don't expect the author to re-analyse the problem using a meshfree method at this stage, but they need to at least provide a paragraph clarifying that other techniques may be more suitable for this problem. For this discussion, the author may refer and cite the following papers:
- Shafee, A. and A. Khoshghalb (2022). "Particle node-based smoothed point interpolation method with stress regularisation for large deformation problems in geomechanics." Computers and Geotechnics 141: 104494.
- Feng, K., Wang, G., Huang, D., & Feng, J. (2021). Material point method for large-deformation modeling of coseismic landslide and liquefaction-induced dam failure. Soil Dynamics and Earthquake Engineering, 150, 106907
- Shafee, A. and A. Khoshghalb (2021). "An improved node-based smoothed point interpolation method for coupled hydro-mechanical problems in geomechanics." Computers and Geotechnics 139: 104415.

A bit more detailed descriptions of the numerical analysis parameters are required. This will increase the study's replicability and scientific rigor.
The authors need to add a discussion on economic analysis of the implementation costs compared to other erosion control methods, and assess the broader environmental impacts, including effects on biodiversity and water quality. This will offer a more holistic view of the method's practicality and environmental sustainability.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Dear Dr. I Nengah Sinarta,
Thanks. You have successfully submitted the revised paper. We would take necessary action as early as possible.
Best regards,
Prof. Dr. Zakaria Hossain
4189: Journal Revised paper
Paper ID number 4189
Revised Title INFLUENCE OF GRASS ROOTS ON THE STABILITY OF SLOPES: EXPERIMENTAL MODELLING AND NUMERICAL ANALYSIS
Full Name Dr. I Nengah Sinarta
Corresponding Author's E-mail inengahsinarta@gmail.com
All-authors E-mails Seperated by Comma aryastanaputu@gmail.com windy.candrayana@gmail.com agsudewa63@gmail.com
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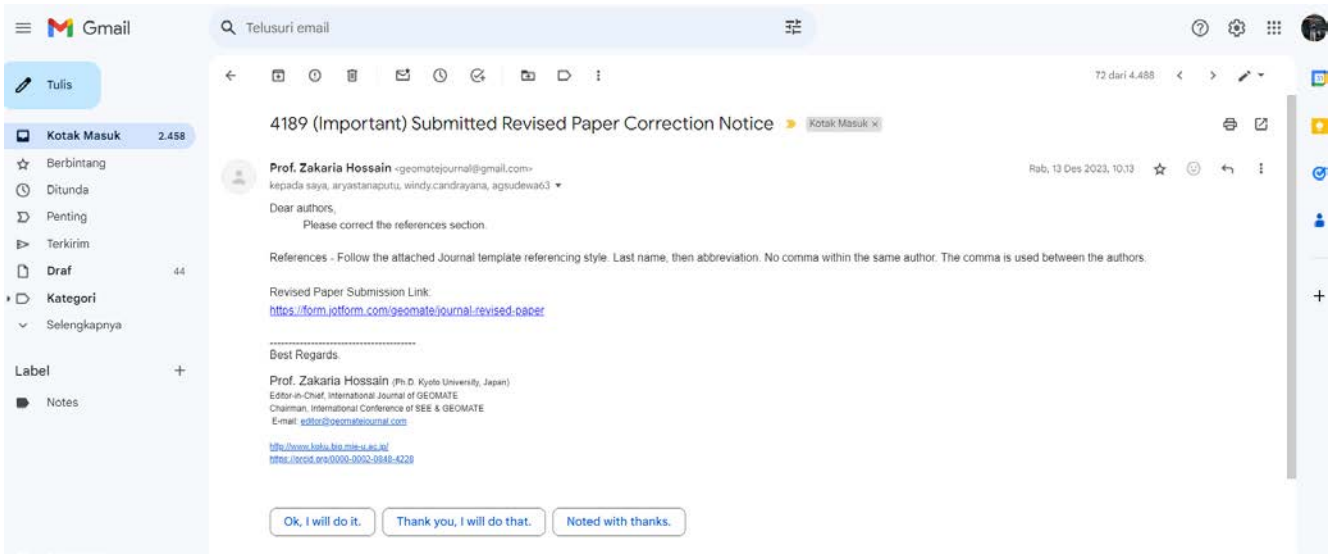
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https://orcid.org/0000-0002-0848-4228
Ok, I will do it.
Thank you, I will do that.
Noted with thanks.

RESPONSE TO REVIEWER

No	Reviewer Comment	Response
Overall response: We have made revisions according to the review, we highlight the revision in yellow color..		
1	Title: The suggested title is INFLUENCE OF ELEPHANT GRASS ROOTS, AND NUMERICAL ANALYSIS OF VOLCANIC SOIL ON DEBRIS FLOWS THREATS	We have changed it according to the suggested title.
2	Abstract: It should be more concise. delete "The research was carried out in the Mountain Batur caldera area, such as Trunyan Village, Abang Batudinding, and Buahan Village. Triggers for debris flows are volcanic soil conditions with loose rocks, steep slopes, lack of vegetation, geological structures, high rainfall intensity and long rain duration. Mitigation and treatment using bioengineering concepts can be an option because it is cheap, environmentally friendly, and can be done independently. " Add some conclusions in abstract.	We have already deleted thus sentences and added conclusions in the abstract.
3	Please include relevant references from the GEOMATE journal to assist readers of this journal in connecting to the paper.	We have added 1 journal from Geomate that discusses vetiver on the terraced slope.
4	Please add a (last) paragraph in the introduction in which the content of the subsequent sections of the article is described.	We have provided a sentence at the end of the introduction to describe this research.
5	Figures: The font inside the figures must be 10 font sizes Times New Roman font or similar and precise (not bold, not italic). Please do not compress the figure (images of 600 dpi resolution or more are preferable). Draw figures clearly and embed text in the image properly. Do not cut and paste from another text and ensure the pictures look useful and readable after printing. Do not use outer boundaries. Figures should be auto-fit to a single column or the width over two columns. Font size in all figures must be 10 font sizes in	We have corrected the image and equation according to the journal template

No	Reviewer Comment	Response
Overall response: We have made revisions according to the review, we highlight the revision in yellow color..		
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6	Research Significance: It is missing (please see the template). Would you please add this section to your paper?	Research significance in page 2
7	References - Follow the attached Journal template referencing style. Authors last name, then abbreviation.	We have corrected referencing style to the journal template
8	Last page: Both columns should be the same height. English: There are many grammatical errors. Please correct it using an English professional editor. Copyright: Q1-Q15: All should be YES	We have checked it grammatically, and we have attached a copyright form

Response by Authors to Reviewer's Remarks/Comments

Investigation of the Influence of Elephant Grass (Pennisetum Purpureum) Roots and Numerical Analysis of Volcanic Soil on Debris Flow Threats

Authors: I Nengah Sinarta, Putu Aryastana, Kadek Windy Candrayana, and I Ketut Agung Sudewa

	Reviewer_A's Comments	Authors Response
1	For the abstract, did the values of 0.0001m and 0.0000064 m in the statement "Model results after four days, there was a decrease of 0.0001m, and after 33 days, there was a decrease of 0.0000064 m." is referring to the height of the slope, or any? Please clarify what this value means.	We acknowledge the reviewer's question. The values of 0.0001m and 0.0000064 m is refers to the slope 45°. We have been modified the sentence on abstract.
2	For Figure 1, please label the left image as (a) and the right image as (b), and update the title of Figure 1 based on (a) and (b). Additionally, the corresponding text needs to be updated as describing in Figure 1(a) or Figure 1(b).	We sincerely thank the reviewer for this correction, the figure has been corrected.
3	For Figure 2, please label the left image as (a) and the right image as (b), and update the caption of Figure 2 based on (a) and (b). Additionally, the corresponding text needs to be updated as describing Figure 2(a) or Figure 2(b).	We are incredibly grateful for your correction, the figure has been corrected.
4	All parameters written in text form should be in italics.	We sincerely thank the reviewer for this suggestion.
5	On page-6, there are two Table 5.	We thank to reviewer pointing out the mistake. We have changed the second table to the Table 6.
	Reviewer_B's Comments	**Authors Response**
1	The sources in the Introduction are adjusted to the References which are sorted alphabetically	Thank your for pointing out this suggestion, the citation and references style that show in the GEOMATE journal template used Number citations consecutively in square brackets [1]
2	Reference is sorted alphabetically	Thank your for pointing out this suggestion, the citation and references style that show in the GEOMATE journal

		template used Number citations consecutively in square brackets [1]
3	Reference number 21 is not found in the sentence	We have highlight the reference number in sentence with yellow color.
4	Add previous research which is stated that the elephant grass had been increase soil strength against landslides-reducing soil erosion (to show differences/support against to this research)	We indeed acknowledge the reviewer for pointing out this important point. We have added three more references to support this statement.
5	Which place is referred to in the sentence "several places" in Bali prone to landslides have tried to plant vetiver grass for water conservation and slope stabilization?	We acknowledge the reviewer's question. We have modified the sentence and added the reference to confirm the statement.
6	Provide a basic theory/reference for the consideration/selection of the use of land in aged of 4 days and 33 days.	We sincerely thank the reviewer again for this constructive suggestion. In response to the request for a theoretical basis for selecting land at 4 and 33 days of age, it is important to understand that these timeframes correlate with critical growth stages of vegetation, such as elephant grass, used for soil stabilization. At 4 days, the focus is on the initial root development, which is key for early soil stabilization. By 33 days, the grass typically reaches a mature phase with a developed root system and sufficient biomass, making it suitable for erosion control and potential use as livestock feed. This selection is grounded in plant-soil interaction theories and agronomic practices, emphasizing the importance of plant growth stages in land use and stability.
7	Table 1 is replaced with rainfall data from 2012 - 2021 (ten years) and directly lists the results from the Pearson Type III Log at 25 years return period (as 69.76 mm). There is no need to include Log Normal and Gumbel data, unless you want to calculate/compare based on 3 rainfall data from these 3 methods.	Thank you for pointing this out. We have revised the Table 1 by exclude the Log normal and Gumbel data.
8	How many millimeter of rain data occurred in 2020? (This rainfall was chosen because it is close to the rainfall value at the time of the landslide in 2020).	We recognize the reviewer's question. The intensity rainfall occurred is 65.3 mm. This value is closed to 25 years return period from Pearson Type III Log.
9	Give sources for each figure and table	We have added the source of figure and table which got from other source.

	Reviewer_C's Comments	Authors Response
1	The title of the paper does not read well. I suggest: "Influence of grass roots on the stability of slopes: experimental modelling and numerical analysis" or something similar to this.	In response to the proposed revision of the paper's title, the recommendation indeed appears to provide a more precise and relevant focus. The suggested title, "Influence of Grass Roots on the Stability of Slopes: Experimental Modelling and Numerical Analysis," effectively captures the primary essence of the research, highlighting the impact of grass roots on slope stability. It also accommodates the critical elements of the study, encompassing both experimental modelling and numerical analysis. This title succinctly and accurately reflects the key themes and methodologies employed in the research, thereby enhancing its clarity and appeal to a scholarly audience.
2	A discussion on long-term performance of the grass planting on soil stability is required. This will provide a more comprehensive evaluation of the effectiveness and sustainability of the proposed solution.	In response to the inquiry, it is indeed imperative to integrate a discussion on the long-term efficacy of grass planting in relation to soil stability. Such an analysis is crucial for providing a thorough evaluation of the effectiveness and sustainability of the proposed solution. This discourse should encompass the enduring impact of grass roots on soil cohesion and structure, the potential for sustained erosion control over prolonged periods, and the ongoing maintenance requirements of the grass. Furthermore, considering the ecological ramifications and the adaptability of the grass to fluctuating environmental conditions would significantly enrich the analysis. By addressing these elements, the study will furnish a more comprehensive understanding of the long-term advantages and challenges associated with grass planting as a method for soil stabilization. 1. Implementation of natural mitigation using elephant grass for technical aspects in environmental engineering to prevent landslides. 2. Further development and refinement of similar methods in environmental engineering.

		3. More in-depth research, including the exploration of plant species diversity. Potential implications for research in areas with varied soil conditions.
3	The authors have used Plaxis software for their analysis, which is based on the finite element method. However, debris flow often involve large deformations, hence other numerical techniques may be more suitable for modelling this problem. I don't expect the author to re-analyse the problem using a meshfree method at this stage, but they need to at least provide a paragraph clarifying that other techniques may be more suitable for this problem. For this discussion, the author may refer and cite the following papers: ✓ Shafee, A. and A. Khoshghalb (2022). "Particle node-based smoothed point interpolation method with stress regularisation for large deformation problems in geomechanics." Computers and Geotechnics 141: 104494. ✓ Feng, K., Wang, G., Huang, D., & Feng, J. (2021). Material point method for large-deformation modeling of coseismic landslide and liquefaction-induced dam failure. Soil Dynamics and Earthquake Engineering, 150, 106907 ✓ - Shafee, A. and A. Khoshghalb (2021). "An improved node-based smoothed point interpolation method for coupled hydro-mechanical problems in geomechanics." Computers and Geotechnics 139: 104415.	In response, it is advisable for the authors to incorporate a paragraph that acknowledges the constraints associated with the employment of Plaxis software, which operates on the finite element method, particularly in the analysis of debris flow phenomena. Given the propensity for substantial deformations in debris flows, elucidating the potential applicability of alternative numerical methodologies, such as meshfree methods, would enhance the comprehensiveness of the study. This supplementary information would not only fortify the research's analytical rigor but also furnish insightful guidance to readers contemplating divergent methodologies in analogous research endeavors. Citing scholarly articles that elucidate the application of these alternative numerical strategies would lend a robust scientific foundation to this discourse. 1. Utilizing the node-based smoothed point interpolation methods (NSPIMs) within the context of the particle finite element method (PFEM), this research addresses substantial deformation challenges in geomechanics. This methodology facilitates the calculation of all variables at the nodes, thereby diminishing the necessity for frequent information transference, a common occurrence in PFEM, consequently augmenting efficiency. Despite encountering numerical instability challenges, the study proposes resolutions through two corrective techniques. The efficacy of this approach is corroborated through three numerical examples, demonstrating enhanced proficiency in the analysis of significant

		deformation problems (Shafee, A. and A. Khoshghalb, 2022) 2. The study concludes that the Material Point Method (MPM) is highly effective for modeling large deformation problems such as soil slope and earth dam failures under seismic loading. MPM overcomes the limitations of traditional mesh-based methods, particularly in capturing complex landslide processes and soil liquefaction. The method demonstrates significant potential in earthquake engineering, especially in understanding seismic slope failures and soil liquefaction mechanisms (Feng, K., 2021). 3. The enhanced version of NSPIMs, termed I-NSPIMs, has been effectively implemented for hydro-mechanical problems in geomechanics. Key modifications include the adoption of linear strain and simplified nodal smoothing domains. Evaluations through various case studies indicate that I-NSPIMs significantly improve accuracy and reduce numerical solution oscillations compared to the original NSPIMs, particularly in flow and flow-deformation problems. In conclusion, I-NSPIMs offer substantial improvements in performance and accuracy for coupled problems in geomechanics (Shafee, A. and A. Khoshghalb, 2021)