Dear Editor:

Thank you for giving me the opportunity to revise the manuscript entitled "Transfer learning for landslide susceptibility modelling using domain adaptation and case-based reasoning" by Zhihao Wang and his/her colleagues that was submitted to "Geoscientific Model Development". The manuscript used transfer-learning strategies to landslide susceptibility assessment (LAS) for 10 different cases in Austria, Ecuador, and Italy. Application of various learning based algorithms are interesting topics in LSA, but regarding the existed literatures needs to be polished properly. In this regard, the following comments are requested to be addressed by the authors:

Comment 1: The English of the paper is readable; however, I would suggest the authors to have it checked preferably by a native English-speaking person to avoid any mistakes.

Comment 2: Add the "….several case studies" in the title.

Comment 3: The concluding remarks of the abstract are not well-written. It's merely the repetition of the objectives and title of the manuscript. in a appropriate abstract, quantitative finding, method limitations, model verification, learning rate and justification have to added. Please kindly modify the abstract.

Comment 4: Considering the existing literature, the motivation of the manuscript is not convincing. There is a large literature associated with LSA, and various techniques have been applied/developed to assess the susceptibility better. I expect to see a novelty in a manuscript dealing with landslide susceptibility because we already have many case studies. I do not think that new case studies would help the scientific community to go one step

further. The result of this manuscript is only valid for the examined area. Based on site-specific conditions and the quality of a landslide inventory, different results can be obtained in another site, and another technique may appear like the best alternative. However, in the end, these efforts do not help us decide on the best method of LSA. So, please kindly request to provide solid document to support the superiority of the method than other approaches. Please check and refer these papers:

1. Kavzoglu, T., Colkesen, I., & Sahin, E. K. (2019). Machine learning techniques in landslide susceptibility mapping: a survey and a case study. Landslides: Theory, practice and modelling, 283-301.

2. Saleem, N., Huq, M., Twumasi, N. Y. D., Javed, A., & Sajjad, A. (2019). Parameters derived from and/or used with digital elevation models (DEMs) for landslide susceptibility mapping and landslide risk assessment: a review. ISPRS International Journal of Geo-Information, 8(12), 545.

Comment 5: The necessity & novelty of the manuscript should be presented and stressed in the "Introduction" section. Please check and refer these papers:

1. Nanehkaran, Y. A., Mao, Y., Azarafza, M., Kockar, M. K., & Zhu, H. H. (2021). Fuzzy-based multiple decision method for landslide susceptibility and hazard assessment: A case study of Tabriz, Iran. Geomechanics and Engineering, 24(5), 407-418.

2. Ngo, P. T. T., Panahi, M., Khosravi, K., Ghorbanzadeh, O., Kariminejad, N., Cerda, A., & Lee, S. (2021). Evaluation of deep learning algorithms for national

scale landslide susceptibility mapping of Iran. Geoscience Frontiers, 12(2), 505-519.

Comment 6: Provide a literature of the methods used learning-based LSA methods in "Introduction". The use of a table to demonstrate the advantage-disadvantage of these methods can be useful. Towards the end, mention the superiority & repeat the novelty of your work. Please check and refer these papers:

1. Wang, Y., Fang, Z., & Hong, H. (2019). Comparison of convolutional neural networks for landslide susceptibility mapping in Yanshan County, China. Science of the total environment, 666, 975-993.

2. Fang, Z., Wang, Y., Peng, L., & Hong, H. (2020). Integration of convolutional neural network and conventional machine learning classifiers for landslide susceptibility mapping. Computers & Geosciences, 139, 104470.

Comment 7: A relevant source of subjectivity and uncertainty is introduced when splitting the input parameters into an arbitrary number of classes with random break values. These choices affect the results. Would you please describe your solution?.

Comment 8: The methodology section is weakly written. So, my suggestion is to reconstruct it. In addition, please kindly use the flowcharts, model verification, benchmarks and error tables to provide detailed methodology.

Comment 9: What will be happened if you use this algorithm for another region?.

Comment 10: Please add a subsection clearly articulating the main limitations, wider applicability of your methods, and findings in the "Discussion" section. Also, the authors should deepen the discussion. Please check and refer these papers:

1. Wu, Y., Ke, Y., Chen, Z., Liang, S., Zhao, H., & Hong, H. (2020). Application of alternating decision tree with AdaBoost and bagging ensembles for landslide susceptibility mapping. Catena, 187, 104396.

2. Azarafza, M., Ghazifard, A., Akgün, H., & Asghari-Kaljahi, E. (2018). Landslide susceptibility assessment of South Pars Special Zone, southwest Iran. Environmental Earth Sciences, 77(24), 1-29.

Comment 11: Please define susceptibility as this terminology is poorly understood by many researchers.

Comment 12: There are no LSA maps that indicate the degree of the susceptibility, please add the required map from triggering factors to risk map. In LSA analysis, providing maps is very important to understand the authors' results.

Comment 13: Please provide justifications for your model, I believe application of other learning based method can be providing much better results (for example: deep learning). Please verify your model with well-known methods.

Comment 14: What type landslide was analyzed? Needs to describe.

Comment 15: Please add the "case study" section and provide relevant information about the geology, morphology, seismicity, hydrology and other triggering factors that impact on LSA.

Comment 16: Please provide the table of hyper-parameters values of all algorithms. Please check and refer these papers:

1. Fang, Z., Wang, Y., Peng, L., & Hong, H. (2021). A comparative study of heterogeneous ensemble-learning techniques for landslide susceptibility mapping. International Journal of Geographical Information Science, 35(2), 321-347.

2. Azarafza, M., Azarafza, M., Akgün, H., Atkinson, P. M., & Derakhshani, R. (2021). Deep learning-based landslide susceptibility mapping. Scientific reports, 11(1), 1-16.

Comment 17: I noticed that the conclusion section tends to repeat abstract and results. The conclusion paragraph should be short, impactful, and direct the reader to this research's next steps and opportunities.

Best regards,