

Dear Respected Referees and Editor of NHESS,

First of all, allow us to convey our sincere gratitude to comments and inputs received from both of referees. We are delighted to receive your comments and suggestions to our paper. We have taken them seriously in our revised manuscript. We thank to your time to read and point out some necessary revisions in our paper. Revisions have been made accordingly. Revisions related to comments from Referee No. 1 are marked in red, and to comments from Referee No.2 are marked in green. Please see in more details in our revised manuscript. Now allow us to also respond to your comments as follows.

OUR REPLIES TO REFEREE NO. 1

COMMENT NO. 1: The paper describes the effects by the 22 December 2018 generated from the Mount Anak Krakatau. The research presents collected data and interview carried out in the following days to the tsunami. The data are clearly reported but the readability of the paper could be improved in some point adding tables, figures and some clarification in the text. A revision of English is needed.

REPLY NO. 1: Thank you for your input and clarification. We have considered your comments and input and will include them in our revised manuscript. Prior to our submission, this manuscript has been substantially checked and proof-read by a professional proof reading company. Nonetheless, we double-check this again before our revised submission to this journal.

COMMENT NO. 2: At Page 2, Para 2: The surname of the author is Gravina, so the citation is Gravina et al., 2019

REPLY NO. 2: Thank you for your correction. We will revise it in the paragraph as well as in Reference section, as suggested. In the text, it can be seen in Page 2 Line 8. In the References, it can be seen in Page 17 Line 17.

COMMENT NO. 3: Page 3 Line 20: This made it difficult to investigate the most southern part of Pandeglang. Along Banten, we investigated about 112 km of its coastlines. Not clear, please rephrase

REPLY NO. 3: The damages caused by the tsunami on transportation lines made us difficult to reach the most southern part of tsunami affected area in Banten. In total, we managed to investigate about 112 km of the coastlines along the Banten Province. The same statement will be added in our revised manuscript. Please see at Page 3 Lines 21-24 in our revised manuscript.

COMMENT NO. 4: Page 3 line 29: The description of the studied are is not very clear and should be improved. I suggest to resume the data about the two studied are in a table where the data from the two are could be reported

REPLY NO. 4: Thank you for your suggestions. All measured data from this investigation will be stored at separate data base containing all flow depths, damage houses, with coordinates and pictures. We aim to store them in the database to make this paper more concise and at the same time the data still can be accessible for everyone. We will improve them in our revised manuscript. The data have been re-arranged and can be seen in Appendix A of our revised manuscript. We also would like to note that all the data are stored at Mendeley Data Sets, and are accessible for public.

COMMENT NO. 5: Page 4 Line 11: A similar method was used to measure impacts of the 29 September 2009 American Samoa tsunami and the 1946 Aleutian tsunami, the 2004 Indian Ocean tsunami in Banda Aceh (Borrero et al., 2006), and the 2018 Palu tsunami (Syamsidik et al., 2019a). Please rephrase this.

REPLY NO. 5: We will rephrase them as follows: Some previous post-tsunami impacts investigations also applied a similar method to this study collecting flow depths, tsunami inundations, and building damages (see Borrero et al., 2006 and Syamsidik et al., 2019a). The sentence can be found at Page 4 Lines 14-17.

COMMENT NO. 6: Page 5 Line 16, please rephrase this statement: . . . This allowed for comparison between cases in the 2004 Indian Ocean and 2018 Mount Anak Krakatau tsunamis.

REPLY NO. 6: Thank you for your suggestion. We will modify the statement as follows: This study compared a tsunami fragility curve produced based on the 2004 Indian Ocean tsunami in Banda Aceh to a fragility curve composed based on the 2018 Sunda Strait tsunami as types of the houses in both areas are similar. The revised statement can be found at Page 5 Lines 23-25.

COMMENT NO. 7: Page 6 Caption of Fig. 2: It would be useful to have also a map with the position of the four tidal gauge station

REPLY NO. 7: The location of the tide gauge stations have been indicated in Fig. 1 (represented by green triangle symbols).

COMMENT NO. 8: Page 7 Line 5: It would be useful to have more details about how the collected data were integrated with interview

REPLY NO. 8: In some case we did interview to local people about the condition before tsunami event to identify tsunami flow depths and boulder position before moved away by tsunami flow. As describe earlier that in Banten area there are many hotels and villas around the coast. During in field we interacted with the hotel owners or their employee where they were cleaning up debris around the affected hotel. We asked about the chronology of that evening tsunami such as time of the event, tsunami height, how many waves detected, if there any boulders we asked their original source. For the flow depth, after the witnesses' explanation we verified its depth by tsunami footprint such as water mark on wall or scratch of bark of a tree around. Methods to incorporate the interviews have been included at Page 4 Lines 27-33.

COMMENT NO. 9: Page 19 Line 21: check this reference Teresita, G., Nicola, M., Luca, F., and Pierfrancesco, C., 2019. Tsunami risk perception along the Thyrrhenian coasts of Souther Italy: the case of Marsili volcano. Natural Hazards. <https://doi.org/10.1007/s11069-019-03652-x>.

REPLY NO. 9: Thank you for your suggestion. We will revise it as same as in the comment No. 2: Gravina, T., Nicola, M., Luca, F., and Pierfrancesco, C., 2019. Tsunami risk perception along the Thyrrhenian coasts of Souther Italy: the case of Marsili volcano. Natural Hazards. <https://doi.org/10.1007/s11069-019-03652-x>. Please see Page 17 Line17.

COMMENT NO. 10: Page 23 Fig. 1: I suggest to add the square represented the studied area with different colors and add a legend with the name of the place included in each area

REPLY NO. 10: Thank you for suggestion, we have revised the figure as it can be found at Fig. 1 in our revised manuscript.

OUR REPLIES TO REFEREE NO. 2

We appreciate very much your valuable time to comment on our paper. We are pleased with your comments and inputs to our paper and we regard them as important contribution to ensure the quality of the paper meet the scientific standard of the Journal. Now, permit us to respond to your comments one by one in the following sections.

THE REFEREE GENERAL COMMENTS:

In this paper, detailed survey data of the area damaged by the tsunami caused by the volcanic flank failure are reported. Also the relationship between tsunami flow depth and damage of houses is discussed. The paper is worth published not only because the data are very valuable but also because the damage was caused only by tsunami without any other effects such as earthquake and associated liquefaction.

OUR GENERAL REPLY: Thank you very much for the comments. We also regard this tsunami as a special case where there is no other impact prior or after the tsunami waves hit the affected area. Therefore, the impacts observed at damaged structures/infrastructures were solely caused by hydraulic impacts combined with the quality of the structures. As the case like this one is very rare, it is an important opportunity for us to investigate further on impacts of the tsunamis on structures.

COMMENT No. 11: P.4, L22: "0.0805 cycle per day" indicates the period of 11.76 day. Such a long period astronomical component has nothing to do with tsunami. Is this a mistake with "cycle per hour"?

REPLY No. 11: Thank you for noticing the mistake. It should be 0.0805 cycle per hour (cph). The revision has been made, it can be seen at Page 4 Line 25.

COMMENT No. 12: P.6: Looking at Fig.2, the amplitude of tsunami wave is about 1m at the highest. The reviewer is wondering why such a small tsunami yielded inundation depth over 5m. Are the tide stations located not on the coast but in deeper waters?

REPLY No. 12: The station was not severely affected by the tsunami waves. Furthermore, the characteristics of the tsunami wave generated in the volcanogenic tsunami has shorter wave length than tectonic tsunami. These resulted in short distance of tsunami runup.

COMMENT No. 13: P.7, L5-7: The report by the interviewees does not correspond to the waveform at the tide station. Any comment should be given on this point.

REPLY No. 13: It is difficult to confirm what the interviewees expressed to the tide gauges data. There are two explanations to this, (1) the locations of the tide stations are far from the locations of the interviewees. Most of the interviewees were not located around any tide gauge stations, (2) records at the Marina Jambu station (which is the closest one) were reported as one-minute average data. With these data, it is difficult to know the first and the second wave if the wave period shorter than one minute. We have added these explanations in our revised manuscript, as requested.

COMMENT No. 14: P.10 and 11: Figure 11 and Figure 12 are interchanged. Need to be replaced.

REPLY No. 14: Thank you very much. We will re-organize both of the figures in our revised manuscript so they will appear in sequential order.

COMMENT No.15: P.2, L7: "was" is duplicated.

REPLY No. 15: Thank you. We have revise the statement to: "This was the case for communities around the Thyrrhenian coast of Italy." The word has been deleted and revised. Please see Page 2 Line 7.

COMMENT No. 16: P.2, L9-10: The reviewer does not understand the meaning of the sentence.

REPLY No. 16: Thank you for noticing the sentence. We have revised the sentence to make it more readable as follows: "As the volcanogenic tsunami event is a long-frequent event, effective counter measures specifically performed to mitigate impacts of non-tectonic tsunamis are difficult to be seen in actual practices". Please see Page 2 Lines 9-11.

COMMENT No. 17: P.2, L25: What is a-45 m wave?

REPLY No. 17: It should be a -45 wave height. We will revise it in our revised manuscript. See Page 2 Line 26.

COMMENT No. 18: P.5, L11: most of them houses → most of them were houses

REPLY No. 18: Thank you, we have included them in our revised manuscript. Please see Page 5 Line 16.

COMMENT No. 19: P.6, L15: Cilegon → Ciwandan

REPLY No. 19: Yes, we agree with the referee. It should be Ciwandan station, not Cilegon Station. Please see Page 6 Line 23.

COMMENT No. 20: P.6, L17: later → earlier

REPLY No. 20: Thank you. We have changed the word accordingly. Please see Page 6 Line 25.

COMMENT No. 21: Caption of Fig.3: "tsunami flow height" should be changed to "run-up height" so that the same expression as in the figure is used.

REPLY No. 21: We have changed the words to "tsunami run-up height" conforming the texts in the figure.

COMMENT No. 22: P.10, 4.2.2: In this section, explanation is given in the order of the area number 4 → 3 shown in Fig.1. Changing the order to 3 → 4 should be better for the readers.

REPLY No. 22: Thank you for noticing the order. We have moved P.10 lines 19-31 to the first part in the section, followed by explanation about Kalianda Area (Area 4) in our revised manuscript.

COMMENT No. 23: P.12, L7: "table 1" should be in Bold.

REPLY No. 23: We agree with the Referee to make it bold. Please see Page 12 Line 24.