



This work is licensed under

a [Creative Commons Attribution-NonCommercial 4.0 International License](https://creativecommons.org/licenses/by-nc/4.0/).

Systematic Literature Review: The Role of Physics in Implementing Disaster Alert Schools in Yogyakarta

Nadya Amalia Putri Hapsari ^{1*)}, Jumadi ², Rio Sebastian ³

Universitas Negeri Yogyakarta, Indonesia^{1,2,3}

^{*)}Corresponding E-mail: nadyaamalia.2022@student.uny.ac.id

Received: December 21st, 2022. Revised: April 15th, 2023. Accepted: June 14th, 2023

Keywords :

School Standby Disaster;
Mitigation Disaster;
Yogyakarta; Physics; SLR

ABSTRACT

School Standby Disaster became a program initiated by BPBD in the Special Region of Yogyakarta for prepare participant educate in face disaster. Aim from study this is for give a systematic literature review (SLR) that will help identify application School Standby Disaster in the Special Region of Yogyakarta through study previously relevant. There are 7 articles reviewed and 5 schools Standby The disaster that was in DIY was made object research. Based on results study show that not yet there is research conducted at high school / equivalent and which integrates mitigation disaster in physics.

INTRODUCTION

Yogyakarta Special Region is one of them provinces in Indonesia that have level potency incident disaster enough nature high. Some areas like Gunungkidul in the form of hills make area this vulnerable occur disaster land landslide especially during the season rain [1]. In the existing area row beach such as in Bantul, Gunungkidul, and Kulon Progo regencies potentially occur tsunami disaster to height of 10 m caused exists gap seismic [2]. Located in an included area in ring of fire cause DIY has one Mountain fiery active [3]. Mountain fiery active can emit ash volcanic and hot lava vomit as well as famous with cloud the heat (wedhus gembel) that is Mount Merapi to be exact located in Sleman Regency [4]. Mount Merapi has cycle disaster Mountain erupted in a manner periodic [5]. BPBD DIY stated that province this have potency happening Mountain erupted with frequency once in 4-5 years time [6].

Special Region of Yogyakarta is included vulnerable area with possibility happening earthquake earth because there is fault active opaque move [7]. According to history, events earthquake earth in Yogyakarta occur in period time around 50 years once that makes DIY in region 4 on the map earthquake meaning earth vulnerable will disaster the [8]. Disaster earthquake earth several times happened in Yogyakarta, the last and has impact great damage. This happened on May 27, 2006 with power 5.9 SR [9]. Based on Unit data Coordination Executor Prevention Disaster Nature (SATKORLAK) DIY 13 July 2006, disaster this killed 5.048 people, 28.000 injured, and 206.504 buildings damaged even collapsed, in between building the is school which is means main for carry out activity education.

Besides disaster caused nature location geographic DIY on the description Previously, there were also other disasters such as fire, wind tight, and collapsed building consequence construction less building sturdy. The disasters that happened of course alone is also destructive facility education, that is school. In this year 2022 has occur fire in some school consequence from short circuit electricity nor reason others of course cause classroom activity disturbed. A school in Gunungkidul last November 2022, it happened roof collapse incident moment activity learning took place and killed 1 student. This the more strengthen that school be one important place for given attention special in matter mitigation disaster by the government.

School Standby Disaster (SSB) being one solution provided by the government as possible effort done since early in face disaster. Effort this is also based with the appeal of the Minister of Education through the Circular Letter of the Minister of National Education Number 70a/MPN/SE/2010. School Standby Disaster have aim for realize culture standby disaster and for build resilience physical nor non- physical When confronted with disaster. this SSB have draft for Upgrade effort awareness in presenting security environment endure learning disaster as well as rescue self moment occur disaster. Hope from the existence of this SSB is could spread various information catastrophe and ways level mitigation unit education optimally [10]. School Standby Disaster have various activity deep disaster the process involved whole inhabitant school including committee school. Activities carried out could form supplies outlook disaster, mitigation disaster, rescue self, and simulation the disaster occurred in a manner periodically [11].

In the Special Region of Yogyakarta initiated since in 2012 by PMI and continued by BPBD DIY. SSB piloting was carried out with base Permendikbud No 72 of 2013, started by 2 schools namely SMK Muhammadiyah Cangkringan and SMP Negeri 2 Cangkringan. The number of SSB is increasing increase every year, especially vulnerable area disaster more prioritized like area near Mount Merapi. According to DIY Bappeda data for 2019 there are 81 SSBs spread across 5 regencies, total this estimated will increase every year.

Table 1. Distribution of SSB in DIY

No	Regency	Level			Total
		ES	JHS	SHS	
1	Sleman	28	11	13	52
2	Bantul	3	3	5	11
3	Gunungkidul	1	2	5	8
4	Kulon Progo	4	0	3	7
5	Yogyakarta City	3	0	0	3
Total					81

SSB implementation that has been going on during one decade this needs identified implementation which includes planning, implementation, and evaluation maintenance School Standby DIY disaster. Besides it is necessary integration is also identified material disaster to in classroom learning especially on the lessons that have linkages with incident natural like disaster. One of the lessons that is physics, so role physics in implementation of the SSB program is also necessary studied because physics is one very close knowledge relation with life everyday. Study this aim for give review literature systematic (SLR) that will help identify and provide description about application School Standby Disaster in the Special Region of Yogyakarta through study previously relevant.

METHOD

Study this done with method Systematic Literature Review. Article database screening done in a manner on line use Publish or Perish software with source Google Scholar search. Title words entered is “sekolah siaga bencana” with range limitation year published articles in 10 years final that is from 2012-2021. The 2022 article is not included because moment study done, in 2022 not yet ended and

not yet all article year this rise entirely.

From search the found 115 articles in the title there is the word “sekolah siaga bencana” or school standby disaster. Then 115 articles the filtered return using Publish or Perish with adding keywords in the form of “mitigation disaster” so 48 articles remaining. Results data search the then moved to Excel for done screening more carry on with method take research articles held in the Special Region of Yogyakarta. There are 26 research articles done in Yogyakarta, then article the chosen with eligible file criteria downloaded for free for then chosen articles published in journals and not is thesis/thesis. After obtained 12 corresponding articles, then article the be read in a manner complete and taken 7 articles whose identity complete. Identity the article in question is name journal, volume, year published, name author, and page. Article database filtering step could be observed through the prism diagram below this.

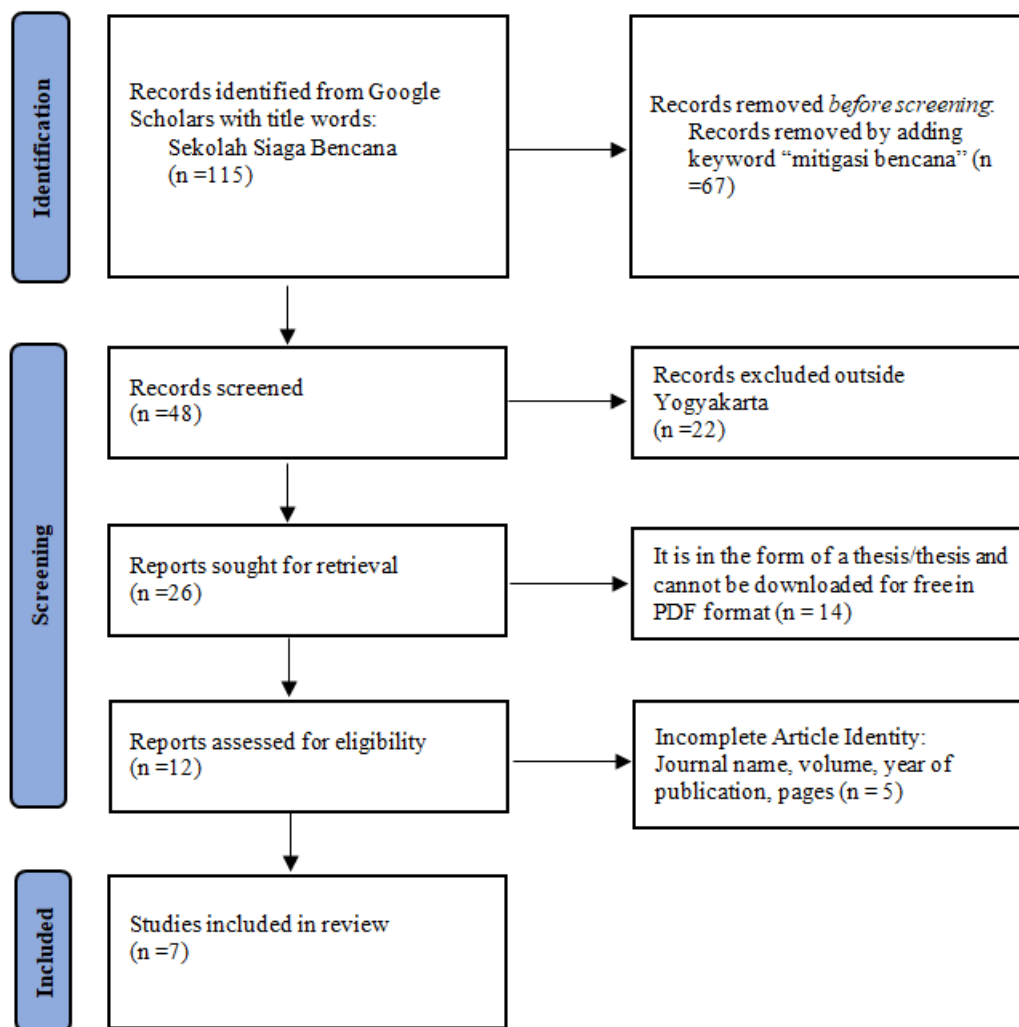


Fig 1. Prism Diagrams

RESULTS AND DISCUSSIONS

Reviewed Research

Study this reviewed 7 articles that met criteria and read in a manner complete. All (n=7) studied studies use method study descriptive qualitative with do observation, interview, and documentation for obtain data. Seventh study do Data analysis uses Miles and Huberman's interactive model, with the process of condensing data, presenting data, and drawing conclusion. Study entirely carried out at

school standby disaster in the Special Region of Yogyakarta.

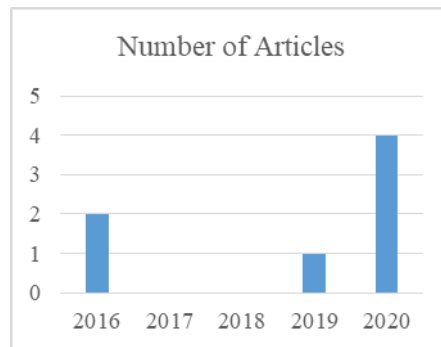


Fig 2. Distribution year rise article

There are 2 early articles published in 2016, 1 article published 2019, and 4 articles published in 2020. Focus article are in SSB management (n=1), SSB implementation/implementation (n=4), partnership (n=1), and role head school in implementation of SSB (n=1).

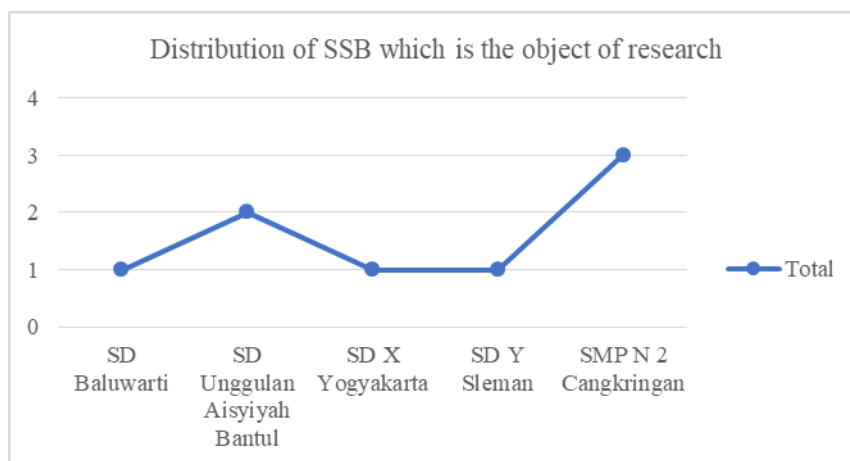


Fig 3. Spread object study

Table 2. Distribution subject study

Article Code	Subject Study									
	Head School	Deputy Chief School	BPBD DIY	Education Authorities	Committee School	NGO	SSB Coordinator	Teacher	Student	Educators
1	✓						✓	✓		
2	✓							✓	✓	
3	✓		✓	✓	✓		✓			
4	✓							✓	✓	
5	✓		✓			✓				
6	✓	✓					✓	✓	✓	✓
7	✓							✓	✓	✓

The object of this study is school standby disaster where of 7 articles is known. There are a total of 5 schools studied because a number of study done in the same school. Research conducted by Dewi &

Iskandar [2] no mention name school in a manner direct. This make exists opportunity that given school the initials of SD X Yogyakarta are SD Baluwarti because is one of the SSB in the city of Yogyakarta. If so, then there is possibility that research at SD Baluwarti found in 2 articles in this systematic study.

From the seven studies reviewed, the majority have subject same research that is headmaster, school program coordinator standby disaster, lesson teacher related, and students. There is added studies related agencies with school programs standby disaster as the subject that is Dewi [12] and Yahya [6] BPBD DIY, Education Office, NGOs, and school’s committees. While Yuliana & Sastiarini [13] and [14] also involved power educator in subject his research.



Fig 4. List of keywords used

The articles reviewed in the study it uses 100% keywords School Standby Disaster or SSB. Besides the number of studies add name school as keywords. Focus research is also listed on the keywords like evaluation, management, policy, implementation, planning, and partnerships.

Table 3. List of articles and results his findings

No	Author and Year Rise	Title	Findings
1	Tyas, RA, Pujianto, P., & Suyanta, S; 2020	Evaluation School program management Standby Disaster (SSB)	Result of study this is the SSB program at SMP N 2 Cangkringan started with planning through equalization perception and commitment between inhabitant school, continued with planning contingency with inhabitant schools, committees, and related agencies. Planning with study level preparedness school as well as training for Upgrade capacity and quality all school stakeholders. Implementation simulation or training drills face disaster has carried out. However, evaluate to implementation of SSB yet implemented in a manner thorough so that SSB goal yet achieved in a manner maximum and still needed various improvement and help from various agency related.

- | | | | |
|---|---------------------------|--|--|
| 2 | Apriyanti, Warda; 2019 | Mitigation Program Implementation Disaster Through School Standby Disaster at Baluwarti Public Elementary School, Kotagede, Yogyakarta | <p>Research results this show that: (1) Four school parameters standby encompassing disaster attitudes and actions, planning and preparedness, policies schools, and human resource mobilization at SD N Baluwarti has fulfilled; (2) Supporting factors implementation of school programs standby disaster that is collaboration Among school with a number of institution such as BPBD, Rumah Hospital, Health Center, Indonesian Red Cross, Police, and TNI, structure earthquake -resistant buildings, existence device supporters in implementation school standby disaster. Conversely, inhibiting factors in implementation of school programs standby disaster that is not yet all teachers provide support on the SSB program, yet available adequate budget and funding sources, lack integration material lesson with SSB, communication with less other institutions maximum.</p> |
| 3 | Dewi, Anggita Ratna; 2020 | Application Policy School Standby Elementary School Level Disaster in Yogyakarta | <p>Based on of 17 points indicator obtained findings that application Policy school standby SD X disaster in the City of Yogyakarta is better than SD Y in Sleman Regency.</p> |
| 4 | Taufik, Ahmad; 2016 | Implementation Policy School Standby Disaster in Build resilience School at SMPN 2 Cangkringan Sleman Regency | <p>Research results this are 1) Implementation of SSB at SMPN 2 Cangkringan done through three pillars of activity, viz Organizing (Cooperation, planning, and drafting material), Interpretation (composition document mitigation disasters and visions mission), and Application (implementation, procurement means infrastructure and integration with learning). 2) Factors that support SSB are exists cooperation with various institution, availability means support, and existence help from BPBD. inhibiting factors that is activity overcrowded school, turnover student every new teaching period, and budget funds are lacking available. 3) Reviewed from 6 aspects of SSB can stated that resilience school belong high. 4) SSB implementation is declared role in strengthening resilience school.</p> |
| 5 | Yaya, Arfan Afkari; 2016 | Partnership In School Standby Disaster at SMP NEGERI 2 Cangkringan, Sleman, Yogyakarta | <p>Results obtained from study this are 1) Established partnerships between SMP Negeri 2 Cangkringan, BPBD DIY, and the Lingkar NGO for school programs standby disaster is partnership in nature mutualistic. In partnership this role the implementer of the SSB program is held by BPBD DIY, mentors and facilitators held by the LSM Lingkar, and SMP N 2 Cangkringan as school target implementation of the SSB program. Activities that have implemented among them is DRR Socialization, Compilation Plan Contingency, Rehearsal Command Post, Debriefin/ Training Emergency in framework Rehearsal Field, Gladi Field (Simulation), and Bimtek & Development</p> |

			Curriculum Disaster. 2) Factor inhibitor in partnership is no coordination intense and lacking max out activity. Whereas factor supporters exist the same goals and needs about need education disaster.
6	Yuliana, Lia and Sastiarini, Kasniati; 2020	Head Role School in School Program Implementation Standby Disaster (SSB) at the Excellence Elementary School 'Aisyiyah Bantul	Research results show role head school in the SSB program includes composer curriculum, underwriter responsible programs and facilities infrastructure used in the SSB program.
7	Qoriandani, Miftachul and Pambudi, Dholina Inang; 2020	Implementation School Standby Disaster at Aisyiyah Bantul Primary School	Research results this show that implementation School Standby Disaster at Featured Elementary School Aisyiyah walk in accordance with preparedness parameters disaster. Factors supporting the Superior SD SSB program Aisyiyah is availability of quality human resources and cooperation with agency related, meanwhile factor inhibitor from this program is lack of school areas and facilities infrastructure.

Application of SSB

Performance parameters school standby disaster covers 3 aspects that is planning, implementation, and evaluation. From aspect planning, in study Apriyanti [15] and Dewi [12] state vision, mission, and goals have load mitigation disaster, however Tyas et al. [10] mention school have aim special about mitigation disaster but no listed in vision mission school. According to study Tyas et al. [10], Dewi [12], Taufik [16], Yuliana & Sastiarini [13], and Qoriandani & Pambudi [14] school has integrated material mitigation disaster to in curriculum, syllabus, and lesson plans. SSB program planning also includes planning budget and facilities infrastructure [10], drafting document evaluation risk disaster [15], and plans action preparedness with provide system warning early along plan evacuation [13] [14] [15].

On the aspect planning, seventh article state that activities carried out form socialization disaster, bimtek curriculum subtraction risk disaster, training technical, simulation evacuation disaster, glady spacious, and gladi post. Tyas et al. [10] add exists agreement in form an MoU with partners and school's buffer as well as involvement of stakeholders and society. In study others, Yuliana & Sastiarini [13] and Qoriandani & Pambudi [14] state exists activity doctor small as well as care and management means internal SSB infrastructure its implementation.

Evaluation is matter urgent for measure success a program, including this SSB. Study Tyas et al [10], Apriyanti [15], Dewi [12], Yuliana & Sastiarini [13], and Qoriandani & Pambudi [14] state that school has carry out monitoring and evaluation activities in a manner routine. According to results studies Tyas et al. [10] implementation evaluation not yet in a manner max, only carried out in activities certain just so that not yet thorough throughout SSB program series. Then on to school others, Yuliana & Sastiarini [13] and Qoriandani & Pambudi [14] state activity evaluation still done internally by the participations of schools, agencies related especially BPBD DIY yet participate as well as in evaluate SSB in the schools. Study Dewi [12] involving 2 schools as subject research, states that Y school yet do activity evaluation because SSB has not been formed for a long time.

Factor Supporters and Inhibitors

In implementation of the SSB program, schools have supporting and inhibiting factors program continuity. Factor SSB program supporters namely structure building school stand disasters and means infrastructure or adequate device [13] [15], good cooperation with agency related [13] [14] [15], and

active qualified human resources in activity [14]. Rather, factor the inhibitor that is lack of budget funds [10] [15] [16], lack means available infrastructure [10] [14], not yet exists inventory means infrastructure [13], not yet maximum communication for coordination with party related [6] [10] [15] [16], no all material lesson could integrated with material disaster [15], lack of human resources [10], limitations bureaucracy and turnover Policy government [6], and land cramped school [14].

SSB 's relationship with Study Materials

Integration material disaster or mitigation disaster is indicator urgent in implementation School Standby Disaster. According to research that has by Taufik [16] and Yahya [6] that in SMP N 2 Cangkringan no there is curriculum special about mitigation disaster, however realized with development existing curriculum. Material integration disaster the performed on a variety of lesson such as science, social studies, Indonesian, English, mathematics, arts culture, and other relevant subjects. Material about mitigation disasters were also integrated to in activity extracurricular scout. Whereas research conducted Tyas et al. [10] state that SMP N 2 Cangkringan has arrange syllabus and lesson plans that contain material disaster, however not yet implemented integration in science learning in class.

At the level school base, reviewed from research by Yuliana & Sastiarini [13] and Qoriandani & Pambudi [14] that SD Featured Aisyiyah Bantul implemented integration mitigation disaster in eye science, social studies, and thematic lessons. In the science lessons, materials disaster associated with material about source power nature. For social studies lessons, materials disaster associated with material about circumstances nature. While on Thematic, because school using Curriculum-13 then material disaster integrated in accordance with theme lesson as well as with incident in life daily for example moment occur flood and wind tight. Research by Apriyanti [15] no mention exists integration with eye lesson, however done moment activity scout. Furthermore, the research conducted Dewi [12] at 2 schools different in Sleman Regency and Yogyakarta City results that second school have document form syllabus and lesson plans that state exists integration material mitigation disaster to in lesson mandatory, payload local and extracurricular.

According to DIY Bappeda data, in 2019 it has there are 81 SSB and 2020 is targeted The Special Province of Yogyakarta has 100 schools Standby Disaster. A total of 26 of the 81 SSB is high school/vocational school level. However, from results screening articles done not yet there is research conducted in high school that can studied though in search literature there is a number of results study form thesis/thesis conducted at SMA SSB. So, from seventh study not yet there is integrating school material mitigation disaster to in eye lesson physics and no mention role physics because no there is research conducted in SMA/SMK/ equivalent.

CONCLUSION AND SUGGESTION

Based on results study literature systematic this show that application school standby encompassing disaster definition, function, and purpose made the program has implemented with category fair to good. Next present use method SLR research, PRISMA diagrams, and Publish or Perish software. Discussion next regarding the search strategy, time search engine locator, and select the database using criteria inclusion in accordance procedure. Then served results synthesis from reviewed articles, then discussed in a manner detailed from review research, application of SSB, and integration of SSB with eye lesson certain. Study results literature systematic this show that study about implementation of SSB yet done in a manner thorough in all level schools in DIY and integration material disaster to in classroom learning not yet implemented in a manner maximum.

ACKNOWLEDGMENTS

We are very grateful to the lecturers of the Master of Physics Education, Yogyakarta State University who have given us the opportunity to conduct this research.

REFERENCES

- [1] Khafid, M. A. (2019). Analisis Penentuan Zonasi Pemukiman Risiko Bencana Tanah Longsor Berbasis Sistem Informasi Geografis: Studi Kasus Kecamatan Gedangsari, Kabupaten Gunung Kidul, Daerah Istimewa Yogyakarta. *Jurnal Meteorologi Klimatologi Dan Geofisika*, 6(1): 49-57.
- [2] Dewi, M. K., & Iskandar, D. A. (2021). Ketangguhan Wilayah Pesisir Selatan Provinsi Daerah Istimewa Yogyakarta Terhadap Bahaya Bencana Tsunami. *Jurnal Perencanaan dan Pengembangan Kebijakan*, 1(1): 1-13.
- [3] Adri, W., Sabri, L. M., & Wahyuddin, Y. (2020). Pembuatan Peta Jalur Evakuasi Bencana Gunung Api Dan Persebaran Lokasi Shelter Menggunakan Metode Network Analyst (Studi Kasus: Gunung Merapi, Boyolali-Magelang). *Jurnal Geodesi Undip*, 10(1): 189-196.
- [4] Bahari, H. (2012). *Ensiklopedi Gunung Berapi Sedunia*. Diva Press.
- [5] Sukanto. (2015). *Manajemen Antisipasi Bencana*. Graha Ilmu.
- [6] Yahya, A. A. (2016). Kemitraan dalam Sekolah Siaga Bencana di SMP Negeri 2 Cangkringan Sleman Yogyakarta. *Spektrum Analisis Kebijakan Pendidikan*, 5(1): 111-124.
- [7] Lestari, A. K. D. (2019). *Identifikasi Zona Patahan Gempa Bumi Yogyakarta 2006 Menggunakan Data Mikrotremor* (Doctoral dissertation, Universitas Gadjah Mada).
- [8] Indriasari, F. N. (2016). Pengaruh pelatihan siaga bencana gempa bumi terhadap kesiapsiagaan anak sekolah dasar dalam menghadapi bencana.
- [9] Pramono, B., & Febriyantoko, D. (2020). Pelatihan Pengembangan Sekolah Siaga Bencana untuk Anak Penyandang Disabilitas MTs LB/A Yaketunis Kecamatan Mantrijeron, Kota Yogyakarta. *Jurnal Pengabdian Seni*, 1(1): 11-22.
- [10] Tyas, R. A., Pujianto, P., & Suyanta, S. (2020). Evaluasi manajemen Program Sekolah Siaga Bencana (SSB). *Jurnal Akuntabilitas Manajemen Pendidikan*, 8(1): 10-23.
- [11] Fadhli, A. (2019). *Mitigasi Bencana*. Gaya Media.
- [12] Dewi, A. R. (2020). Penerapan Kebijakan Sekolah Siaga Bencana Tingkat Sekolah Dasar di Yogyakarta. *HIGEIA (Journal of Public Health Research and Development)*, 4(Special 1): 286-295.
- [13] Yuliana, L., & Sastiarini, K. (2020). Peran Kepala Sekolah dalam Pelaksanaan Program Sekolah Siaga Bencana di Sekolah Dasar Unggulan 'Aisyiyah Bantul. *Jurnal Manajemen Pendidikan: Jurnal Ilmiah Administrasi, Manajemen Dan Kepemimpinan Pendidikan*, 2(2): 131-147.
- [14] Qoriandani, M., & Pambudi, D. I. (2020). Implementasi sekolah siaga bencana pada SD Unggulan Aisyiyah Bantul. *Elementary School: Jurnal Pendidikan Dan Pembelajaran Ke-SD-An*, 7(2):247-253.
- [15] Apriyanti, W. (2019). Implementasi Program Mitigasi Bencana Melalui Sekolah Siaga Bencana di SD Negeri Baluwarti, Kotagede, Yogyakarta. *Spektrum Analisis Kebijakan Pendidikan*, 8(2): 123-133.
- [16] Taufik, A. (2016). Implementasi kebijakan sekolah siaga bencana dalam membangun resiliensi sekolah di SMPN 2 Cangkringan Kabupaten Sleman. *Spektrum Analisis Kebijakan Pendidikan*, 5(4): 408-418.