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STRATEGY FOR DEVELOPING LOCAL CONTENT OF DISASTER EDUCATION IN ELEMENTARY SCHOOLS

Sutinah[1], Styo Mahendra Wasita Aji[1], Abdul Aziz[2*]

[1]Departement of Elementary School Education, Universitas Negeri Yogyakarta, Indonesia
[2*]SDN Pandangwangi 3, Malang City, Indonesia
*Abdul Aziz, email: aziz.ardat@gmail.com

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Abstract
This paper aims to describe the development of local content education for disasters. Disaster risk reduction must be developed through various strategies, including formal education, as early as possible. This article was written using the literature review method. Researchers collect data from literature and documents from various literary sources such as Government regulations, relevant articles, and books. Data analysis with qualitative descriptive. The data are presented qualitatively based on the study focus pattern. This study focuses on expected disaster education, local content and disaster education, development of disaster local content education, and implementation strategies of disaster local content education. Disaster education should ideally be implemented as early as possible, starting the first formal education in elementary school. The position of local content opens up opportunities for disaster education in elementary schools through the uniqueness of the region. The development of local content of disaster education contains: education environmental insight, disaster risk reduction education programs, and disaster moral response. The five steps of the implementation strategy are curriculum development, teacher training, limited trials, extensive trials, and evaluations. Eventually, the development of local content of disaster education has the potential to develop students' resilience to disasters.

1. Introduction

"*Megathrust*" is a word that has become a shadow of the concerns of the people of Indonesia today. The real threat of a major disaster should not be fear but should receive attention as study material for disaster education. Indonesia is a country with one of the largest disaster potentials in the world. Indonesia's position is in the seismic region of Southeast Asia (Mardiani & Nugraha, 2023). Indonesia is among three tectonic plates: Eurasia, the Pacific, and Indo-Australia. In addition, Indonesia is in the "*ring of fire*" area. This means that Indonesia is in the largest volcanic cluster in the world. Therefore, earthquakes, tsunamis, and volcanic eruptions as disasters are challenges daily.

The long history of the Nusantara archipelago shows that volcanic and tectonic disasters have been vulnerable for centuries. We know that the famous eruption of the Krakatau volcano is very large in the records of modern human history. Then, the eruption of the Tambora volcano resulted in several surrounding villages being buried and creating a seasonal anomaly in the world (Wilson et al., 2023). The tectonic record of the Aceh earthquake reached more than 9.3 magnitude in 2004, which resulted in a tsunami and claimed around 166,541 lives (Havwina et al., 2017). It became an early warning and disaster record in Indonesia.

In addition to the catastrophic challenges of tectonic and volcanic influences, other disasters, such as those due to the influence of climate change, deserve attention. Because disasters such as tornadoes, flash floods, landslides, and droughts can occur. These various kinds of disasters can occur anywhere in regions throughout Indonesia. Each region has its own vulnerability to these various disasters. Vulnerability makes Indonesia one of the 35 countries most prone to disasters, according to the *World Bank* (Intan, 2021). This is emphasized by the 2014-2024 natural disaster trend data released by the National Disaster Management Agency (BNPB, 2024a) as follows.

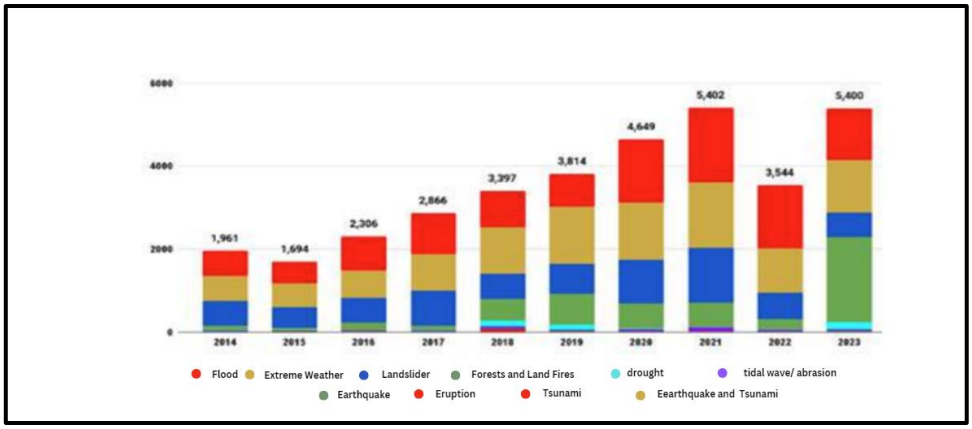

Figure 1. Natural Disaster Trends in Indonesia 2014-2023
Source: (BNPB, 2024a)

Disaster management is basically a shared responsibility. Disaster management is mandated in the preamble to the 1945 Law, to protect the entire Indonesia nation and all of Indonesia's bloodshed, and to promote public welfare, educate the nation's life, and participate in implementing a world order based on independence, lasting peace, and social justice. Therefore, there are derivative rules based on the mandate of the preamble to this law. It is fitting for issuing the rules of the Disaster Management Law number 24 of 2007 concerning Natural Disasters (Undang-Undang Nomor 24 Tahun 2007 Tentang Penanggulangan Bencana , n.d.). This law states that "everyone has the right to get education, training, and skills in implementing disaster management." The rule implicitly hints at the participation of the education world in disaster management.

Then, the rules are followed through the national medium-term development plan (RPJMN) in the following years (Rencana Jangka Menengah Nasional 2021-2024, 2020). Disaster management efforts are contained together with the environment. Including in the 2020-2024 RPJMN. The Government also signed through Presidential Regulation number 87 of 2020 concerning the 2021-2044 Disaster Management Master Plan (Peraturan Presiden 87 Tahun 2020 Tentang Rencana Induk Penanggulangan Bencana 2020-2044, 2020). Based on this Presidential Regulation, each region is required to have a disaster management master plan. Indonesia has a large area and diverse landscapes. Each region has diverse disaster potential.

Several Government rules and plans show that there is a mandate for disaster management, including the participation of the world of education. So far, the role of education in disaster management is still minimal. The government still has minimal capacity to accommodate disaster education in schools (Aroyandini et al., 2023). Although disasters can be faced by anyone and at any age, there have been no serious steps to increase disaster awareness through education. Elementary school education as a formal place for children's education has also not provided comprehensive education with a local approach.

Disasters have been taught in certain themes. Learning is still more *book-oriented*, so training in simulating local disaster situations must still be developed. The strategic plan of the directorate of elementary schools of the Ministry of Education and Culture for 2021-2025 mandates disaster emergency response in elementary schools and post-disaster psychosocial within the framework of the realization of the program to improve access to services and elementary school education services (Rencana Strategis Direktorat Pendidikan Sekolah Dasar 2021-2025 , 2021). The mandate is also revealed in the technical instructions for the disaster safety education unit (SPAB) program nationally. Therefore, further studies are still needed on developing disaster local content education in elementary schools that are close to students.

2. Method

Methods in writing articles through the literature review method. Data collected from various articles, books, scientific papers, and Government regulations relevant to the theme raised are studied. The literature focuses on disaster education and local content in elementary schools. The

study was carried out to find a strategy for developing local content for disaster education in elementary schools. Data analysis is through qualitative descriptive, where the research begins with formulating problems about disaster education and the importance of local content. Then, the selection of data will be determined according to the focus of the research. Data collection was continued through articles, books, scientific articles and Government regulations in accordance with the focus of the research. The data is then reduced according to the focus studied. Then, the last is the drawing of conclusions.

3. Results and Discussion

3.1. Expected Disaster Education in Elementary Schools

Disaster is a challenge that humans always face. According to the great Indonesian dictionary, a disaster is something that causes damage. Natural disasters mean damage that comes from nature. Natural disasters can occur at any time, so more vigilance is needed. They can impact anyone, anytime and anywhere. Therefore, everyone, including educational actors, must be aware of natural disasters.

Education as a conscious and planned effort should play a role in preparing people who are aware of disasters. According to the 2003 National Education System Law, education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have religious and spiritual strength, self-control, personality, intelligence, noble morals, and skills needed by themselves, society, nation, and state (*Undang-Undang Nomor 20 Tahun 2003 Tentang Sistem Pendidikan Nasional*, n.d.). Disaster education should ideally be provided as early as possible. This is because every individual in the nation needs to have intelligence, noble morals, and the necessary skills to deal with disaster situations.

Elementary school, as the first level of formal education, can be a place for disaster education as early as possible. Educators' participation can help students become aware of disasters. Disaster preparedness does not grow by itself. It needs to be carried out systematically in education, planned, implemented, and evaluated continuously.

Formal education, such as elementary schools, should include disaster education in the curriculum. Elementary schools can include stand-alone subjects. Educational units can make it local content. This follows the characteristics of local content, which is an open subject and can be developed according to the potential of each region and its wisdom. By being raised as a subject based on local content, disaster education can prepare a study of the potential for local disasters that need to be watched out for by everyone in a certain place.

The objectives of disaster education are expected to be held as follows: a) realizing elementary school students who have disaster responsibility for themselves, b) realizing elementary school students who are aware of disasters both from knowledge, attitudes, and skills, c) realizing elementary school students who have disaster moral responsibility, d) realizing continuous disaster education and training, e) realizing participatory disaster education, f) realizing awareness of environmental insight for elementary school students and, g) realizing elementary school students who have a spirit of volunteerism.

3.2. Local Content and Disaster Education

Local content is study material or subjects in educational units that contain content and learning processes about local potential and uniqueness (Regulation of the Minister of Education and Culture number 79 of 2014) (Permendikbud Nomor 79 Tahun 2014 Tentang Muatan Local, 2014). The existence of local content is an opportunity for the development of disaster education. Local content containing a learning process about local potential and uniqueness leads to a local approach to providing students with disaster mitigation (risk reduction).

Each region in Indonesia, with its diversity, has its own disaster potential and risks. An area's characteristics describe the potential disasters that can occur in that area. For example, every soul

living in coastal areas is at risk of a flash flood or tsunami. Meanwhile, other souls in barren mountainous areas are under the shadow of landslides and droughts in the dry season.

The introduction of disaster education can be integrated or included in local content. Through local payloads, disaster mitigation can be inserted or stand up in its entirety. Mitigation learning through situation simulations that encourage students' emergency response to disaster situations. This means that local content accommodates mitigation that is not just "*book-oriented.*" As local content that emphasizes more on direct and functional practice for students (Basari, 2014).

Disaster education opportunities in local content are about appreciating local uniqueness. Everything unique and distinctive locally is included in disaster mitigation. Each region has a uniqueness that has been passed down in its area to reduce the impact of disaster risk, known as local wisdom (Desfandi, 2014; Eraku et al., 2023). This local wisdom has become a regional advantage in disaster mitigation. Regional advantages are included as local content (Anggraeni, 2019). Local wisdom in disasters has functional value for students so that it can become local content.

Disaster local content education can be developed based on the relationship between local content and disaster education. The development of disaster local content education can start with understanding the environment and then developing knowledge on disaster risk reduction. Development is emphasized on meaningfulness by being marked by students' ability to internalize the moral responsibility of disasters to themselves.

3.3. Development of Disaster Local Content Education

3.3.1. Education Environmental Insight

Natural disasters can occur due to various factors. Humans need to understand the nature around them to prevent disasters. If it cannot be prevented, humans need to understand the efforts to be aware of the possible disasters that can occur at any time in the surrounding environment. The participation of environmental insight education is one of the bridges for humans to try to understand their environment.

Environmental insight education provides a comprehensive overview of the environment and its potential. Environmental problems are not personal but collective problems (Darsiharjo, 2013). When the environment is damaged, it can impact other people. In other words, damage done by one person can become a disaster threat to others.

Education can be used to make people aware. Environmental awareness helps students understand their area's potential. These potentials are sometimes very profitable and sometimes detrimental. Let us call it the potential that exists, namely disasters.

Furthermore, environmental insight education trains students to be responsible for their environment. Students also think about ways to prevent damage from happening too quickly so that the environment has the opportunity to recover and can sustainably support life (Darsiharjo, 2013). This program emphasizes mastery of environmental conditions and alternative problem-solving.

Environmental insight education programs can be used for low-grade elementary students. The students can participate in several activities considered valuable and related to disasters. *First*, students are invited to recognize the surrounding environment and the wisdom of disasters. This means that students are sought to learn everything around them. In the *second activity*, students are invited to study the current condition of their environment. Students are invited to participate in potential disaster activities that may occur by looking at the current environmental conditions around them. *Third*, students are invited to look for information on various potentials that can be useful when a disaster occurs in their environment. This activity is like finding staple materials that are still useful when a disaster occurs in the student's environment. *Fourth*, students learn about the potential for disaster prevention in their surroundings through guided exploration activities.

3.3.2. Disaster Risk Reduction Education Programs

Before we explore the disaster risk reduction education program, we should pay attention to the results of the disaster risk assessment by BNPB (BNPB, 2024b). BNPB has released information on disaster threats, vulnerabilities (population, physical, economic, and environmental losses), capacity, and disaster risk in inarisk.bnpb.go.id applications and websites. Infographics about disaster risk are displayed. The public can access disaster risk information at the district/city level.

The disaster risk information displayed in the inariks differs for each district/city area. For example, in 2023 in Malang City, the disaster risks presented include floods of 17%, flash floods of 17%, and extreme weather of 100%. It differs from Yogyakarta City, including the risk of flood disasters of 32%, drought of 100%, and liquefaction of 100%. The percentage is taken from the many people who are exposed and unexposed.

Although the disaster presentation of each region is not the same, BNPB provides recommendations based on the same seven criteria. The criteria in question are: 1) strengthening policies and institutions, 2) risk assessment and integrated planning, 3) development of information, training and logistics systems, 4) thematic handling of disaster-prone areas, 5) increasing the effectiveness of disaster prevention and mitigation, 6) strengthening disaster emergency preparedness and handling, and 7) development of disaster recovery systems. Although the criteria are the same as seven, the recommendations in each region are not the same. Recommendations are given based on the level of risk and the type of disaster that occurs/will occur in each district/city.

Looking at the seven criteria proposed by BNPB above, especially the fifth criterion, it is necessary to increase the effectiveness of education-based disaster prevention and mitigation. Disaster education can be included in the curriculum of the educational unit. Education units can be included in the curriculum after the issuance of each regional policy, such as a regional regulation to activate disaster education. Regions can make policies based on the risk assessment that BNPB has presented in inarisk.

Considering that each region's disaster risk is not the same, regions can develop disaster education through local content that can be included in the curriculum of educational units. Each region can develop disaster education that is different from other regions. The difference can also be drawn in the outline referring to the proposed disaster curriculum content by the Ministry of Education and Culture. The curriculum's content is pre-disaster, emergency handling, and post-disaster recovery.

The disaster risk reduction education program that we propose focuses on knowledge about various disasters and their response. As mandated in Disaster Law Number 24 of 2007, disaster management can occur in pre-disaster, emergency response, and post-disaster. Disaster risk reduction education focuses on the ability of each individual to take responsibility for himself. This means every individual is expected to be resilient enough to face disasters. Each has the resilience of pre-, during, and post-disaster coping.

First, disaster risk reduction programs begin with broader knowledge about disasters. Students learn about various types of disasters, each of which can arise, and study its causes and impacts. This initial activity emphasizes disaster knowledge, which must be possessed.

Second, this program pursues providing students with knowledge when disasters occur. Students learn to self-rescue during disasters according to procedures. They also learn about evacuation during disasters. Education is also equipped with simulation activities following the disaster that occurs.

Third, this program aims to provide students with an overview of post-disaster handling. Students learn about the risks that can arise after a disaster and how to manage the rescue of valuables.

Fourth, this program is pursued with disaster traumatic recovery activities. Students learn tips for mentally healing from trauma. They must be sure to have an overview of how to prepare for and heal themselves from the trauma of a disaster that can arise.

3.3.3. Disaster Moral Responsibility Education

This program fosters disaster-resilient character in students. Senior elementary school students are expected to not only take responsibility for themselves when a disaster occurs but also begin to take moral responsibility for their fellow humans. From here, it is hoped that it has described the generations who care.

The disaster moral responsibility education program trains students to sense *crisis* and disaster morale. Moral context is in the sense of *moral knowing, feeling, and acting*. Disaster preparedness should ideally be internalized in the mind of every person so that they not only have knowledge but also have a sense of social responsibility when a disaster occurs. Through morality, they understand the right behavior in the environmental situation that is happening (Karimah et al., 2021).

In this program, students learn the values behind disasters, hone their attitudes toward disaster crises, and understand the knowledge, attitudes, and actions they must take. Students then learn about disaster responsibility. They learn their responsibility to save themselves first. Then, they also learn a sense of social responsibility based on their previous disaster knowledge. Students learn to be responsible when disasters occur, especially when evacuation is involved.

Students learn about participation in disasters because disasters are a shared responsibility. Students must know that participatory measures can reduce the risk of a real disaster. Participatory activities can be carried out in disaster simulations. Students can try to care as much as they can.

Finally, students learn about the values of volunteerism. As they age, they have the potential to intervene when a disaster occurs. Here, students learn about the various attitudes of volunteerism. Then, they try to practice in a simple volunteer situation activity that can help others. Volunteerism is a voluntary act to help others (Hidayah et al., 2022).

From the activities above, it is hoped that high-class elementary students will already have a sense of humanity. When a disaster occurs anywhere, they will have a *sense of crisis*. They will volunteer to build solidarity and help fellow human beings who are victims of disasters in other places as much as possible. They also understand the moral responsibility of educated human beings towards disasters they may face at any time.

3.4. Disaster Local Contel Education Implementation Strategy

We begin to discuss the implementation strategy of disaster local content education by looking at the writings (Gong et al., 2021), one of which is about the dimensions of knowledge, attitudes, skills, and participation in the Geography curriculum standards at the basic education level in China. Since 1986, China has included the subject of geography in primary, junior high, and high school education curricula. Especially for basic education, the knowledge dimension of the flood disaster charge of the famous Huang He River, the name of the Yellow River, has been included in the learning. The dimension of his attitude is non-existent. The dimension of his skills is studying the management of the Yellow River. The load did not change until 2000, even though the load at other levels had been changed up to 5 times, namely in 1988, 1990, 1992, 1996, and 2000.

Through the beginning of the third millennium in 2001, the content of disaster knowledge was expanded not only to floods in the Yellow River. This first change expands the scope of disaster content materials at the basic education level in China. The expansion of the material includes an understanding of the various major disasters that have occurred in China. They began to study parts of natural areas prone to disasters. That year, the dimension of disaster attitude began to be taught, namely learning ways to save oneself and help each other in dealing with natural disasters, as well as developing appropriate skills. The skill dimension is developed by assigning students to report examples of major natural disasters from media reports to understand the extent of the damage. Starting in 2001, the dimension of participation was also developed, which teaches how to appreciate the value of solidarity and help each other among people in difficulty.

The next change in the geography curriculum was in 2003, and the above content was maintained until there was a change in the basic education level in 2011. The 2011 amendment completes the scope of the previous material in 1986 and 2001. In this change, the disaster load

knowledge dimension is equipped with knowledge of earthquakes, floods, and major disasters that occurred in China, and it is continuing to study parts of natural areas that are prone to disasters. The dimension of attitude develops by learning methods of self-protection and mutual cooperation in dealing with natural disasters to carrying out self-rescue simulation activities. The dimension of his skills collects examples of major natural disasters such as earthquakes and floods to understand the magnitude of the damage they cause. The dimensions of participation in 2011 remained the same as in 2001.

Unlike China, Japan has been hit by various natural disasters. According to (Fujioka & Sakakibara, 2018), this is the basis for Government agencies that handle administration in the field of education to respond in various ways. For example, in 1995, the Hanshin-Awaji earthquake disaster became the basis for the Ministry of Education, Culture, Sports, Science and Technology (MEXT) to re-examine the safety of school disasters. Produce additional materials about natural disasters and disaster prevention education. Then, teacher training focused on the Hanshin area and its surroundings.

Next, there were seven more major earthquakes in Japan. Some of them were in 2004 in Chuetsu and 2007 in Chuetsuoki. In addition, heavy rains were also recorded in Niigata in 2004, Fukushima in 2011, and northern Kyushu in 2012 and 2017. Landslide in Hiroshima in 2014. The biggest disaster that hit Japan was a major earthquake and tsunami in eastern Japan in 2011. It caused enormous damage to students, school staff, and school facilities at that time. More than 600 students and school staff were killed in the disaster. All these losses are caused by tsunamis that occur after a major earthquake. More than that, it caused an accident at the Fukushima nuclear power plant.

Since then, MEXT has published a guidebook for the preparation of school disaster prevention. Furthermore, it was revised in 2013 into the book "Spirit for Life: Disaster Prevention Education" given to each school. In essence, schools can develop various learning methods and content that consist of relationships with nature, science, technology, energy, the environment, and the international community to minimize disaster risk. Especially for educators in the areas affected by the nuclear disaster in Fukushima, materials on reconstruction, disaster prevention, and radiation education are added.

Indonesia itself has issued regulations related to disaster prevention at the level of education units. Through the Ministry of Education and Culture (Kemendikbud), the Government of the Republic of Indonesia issued Regulation of the Minister of Education and Culture of the Republic of Indonesia number 33 of 2019 concerning implementing the Disaster Safe Education Unit Program (Peraturan Menteri Pendidikan Dan Kebudayaan Republik Indonesia Tentang Penyelenggaraan Satuan Pendidikan Aman Bencana, 2019). The goal, one of the things listed in article 2 letter e, is to provide educational services that follow the characteristics of Disaster Risk and the needs of the Education Unit. Furthermore, Article 6, Letter I emphasizes one of the obligations of the Regional Government, which is to integrate materials related to disaster prevention and management efforts into the relevant local content curriculum. This means that the government encourages the implementation of disaster education, one of which is through local content following the needs of the Regional Government.

Local content, according to the Independent Curriculum, can be developed into a separate subject in the intracurricular. The Ministry of Education and Culture has issued a module on the Development of the Local Content Curriculum in May 2024 (Badan Standar, 2024). The module demonstrates local content principles, namely contextual, flexible, useful, and appreciative. Contextual is following the region's potential (natural, social, and/or cultural environment) to face current and future challenges. Flexible in the conditions and characteristics of the educational unit. Usefulness is oriented to identifying, preserving, and developing regional potential in facing global challenges. Appreciation can be done through performances, competitions, and awards at educational, regional, and/or national units.

The potential of each region is not the same. This potential includes disaster risks that differ from one region to another so that it will assess local disaster content in each region not the same. As previously exemplified between Malang and Yogyakarta. From that risk, regulations arise from regional leaders that are not the same. For example, the Mayor of Malang has issued Malang Mayor

Regulation 28 of 2023 concerning Disaster Mitigation Implementation Activities. In the mayor's regulation, article 15 paragraph (1) Implementation of Education, Training, and Counseling as referred to in Article 3 letter c is carried out through activities, one of which is socialization and simulation of the Disaster Safe Education Unit (Peraturan Wali Kota Malang Nomor 28 Tahun 2023 Tentang Kegiatan Mitigasi Bencana, 2023). It differs from the Mayor of Yogyakarta, who changed the Regional Regulation of the City of Yogyakarta number 3 of 2011 concerning Regional Disaster Management, to the Regional Regulation of the City of Yogyakarta number 6 of 2023. Article 5 letter f reads to encourage the role and independence of the community at the level of Villages, Urban Villages, Ministry of Agriculture, and Education units (Peraturan Daerah Yogyakarta Nomor 3 Tahun 2023 Tentang Penanggulangan Bencana Daerah, 2023).

The focus of the two local governments above is clearly different. Malang City directly targets education units by providing socialization and simulation of the formation of disaster-safe education units. Meanwhile, Yogyakarta City focuses on integrating educational units with villages, sub-districts, and even the ministry/sub-district level in disaster management. It can be seen that Malang City is superior in terms of planning in the disaster-safe education unit. The city of Yogyakarta is superior in cooperation between various institutions in dealing with disasters.

The implementation of disaster education can only focus on general disaster materials without involving the local wisdom of a region. Local wisdom in dealing with disasters should be considered as the core of each region's disaster risk reduction program. For example, in the city area, the method of disaster management will be different from that in the Village area. This is reflected in the focus of achievements in 2025-2029 in Presidential Regulation (Perpres) number 87 of 2020 concerning the 2020-2044 Disaster Management Master Plan, namely the realization of spatial and settlement planning as well as integrated urban planning for disaster resilience and climate change adaptation, as well as social resilience and public health resilience (Peraturan Presiden 87 Tahun 2020 Tentang Rencana Induk Penanggulangan Bencana 2020-2044 , 2020). Indeed, in the Presidential Regulation, there is no discussion of disaster resilience planning at the Village level, specifically like the city; however, in other Government institutions, there is. As stated in the Guidelines for the Implementation of SNI 8357:2017 Disaster Resilient Villages and Villages issued by the National Standardization Agency.

Based on the above study, a strategy for implementing the local content program for disaster education is proposed. The strategy involves five steps. In this implementation, attention is also paid to the parties involved. Time considerations are also part of determining the implementation strategy through the five steps described and outlined below.

Figure 2. Disaster Local Content Education Implementation Strategy

First, the program begins with preparing a curriculum for local content of disaster education. A curriculum is a set of plans and arrangements regarding the objectives, content, subject matter, and methods used as guidelines for implementing learning activities to achieve certain educational goals (National Education System Law, 2003) (*Undang-Undang Nomor 20 Tahun 2003 Tentang Sistem Pendidikan Nasional*, n.d.). This preparation was carried out with *a focus group discussion* (FGD)

activity regarding the organization of the curriculum that elementary school students will study. The activity can present practitioners, academics, and *related stakeholders* who are disaster experts. Focus *group discussion* (FGD) activities are expected to produce curriculum documents regarding learning outcomes, learning objectives, the flow of learning objectives in local content, and evaluations that can be used.

Second, teacher training programs regarding disaster education. This activity was carried out to train teachers to recognize disaster competencies that will be learned for their students at each stage at the elementary school level. Activities can also include preparing syllabi and/or teaching modules/textbooks as disaster materials that will be taught to students. This activity involves experts as teacher trainers and teachers as actors.

Third, the pilot program is limited to local content of disaster education. The activity was carried out in schools that were considered to have qualified infrastructure and educators. Facilities and infrastructure can be developed to describe disaster preparedness schools. The curriculum is developed with teachers who have been trained in disaster education with the assistance of *relevant stakeholders*. Furthermore, assessments can also be carried out for programs. The activity involved teachers, students, principals, and program supervisors. Limited trials can be carried out in disaster preparedness schools. It will be helpful to further examine the advantages and disadvantages of programs and curriculum documents through assessment.

Fourth, the program to implement local content of disaster education widely in schools. This activity is carried out in general schools. Activities based on improving the assessment results in the third phase of the trial are limited. Each grade level will carry out activities according to their level. This activity involves teachers and students. Activities can be carried out according to the grade level in the next semester after conducting a limited trial.

Fifth, the evaluation program for implementing local content of disaster education. The activities in this program evaluate both knowledge and student practice. Students are evaluated through test techniques and simulations necessary to determine their ability to deal with disasters. This activity involves teachers, students, other school residents, and the occasional program supervisor team. Activities can be carried out once a month formatively and at the end of the semester summatively.

4. Conclusion

Education is responsible for preparing students to be members of society who are responsive to disasters. The reality of Indonesia, one of the countries with the potential for disasters in the world in its history, needs attention. The diversity of characteristics and potential disasters that show the differences between regions have their own characteristics and must be carefully prepared. The literature review shows that there are expectations about ideal disaster education, the potential for local content for disaster education, the development of local content education for disasters, and disaster education implementation strategies. As a study, developing local content education for disasters can potentially build students' resilience in disasters. Especially disasters related to oneself and the environment. Local content that contains environmental insights, disaster risk reduction, and disaster moral responsibility can determine the direction of disaster education development that shapes students to respond to disasters in terms of knowledge, skills, and attitudes.

Author Contributions

CRediT roles: Sutinah: Conceptualization, Data curation, Formal analysis, Investigation, Resources, and Visualization. Styo Mahendra Wasita Aji: Methodology, Roles/Writing—original draft, Writing—review and editing. Abdul Aziz: Investigation, Project Administration, and Resources. All authors have equal contributions to the paper. All the authors have read and approved the final manuscript.

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References

Anggraeni, D. (2019). Implementasi kurikulum pendidikan dasar lingkungan hidup dan mitigasi bencana di sekolah dasar. *Metodik Didaktik: Jurnal Pendidikan Ke-SD-An*, *15*(1).

Aroyandini, E. N., Rusilowati, A., Supriyadi, S., Hartono, H., Retnoningsih, A., Marianti, A., Hamid, N., & Juhadi, J. (2023). Urgensi dan tantangan mengajarkan pendidikan kebencanaan melalui pembelajaran IPA. *Prosiding Seminar Nasional Pascasarjana*, *6*(1), 245–253.

Badan Standar, K. dan A. P. K. P. K. P. K. R. dan T. (2024). *Modul pengembangan kurikulum muatan lokal*. Badan Standar, Kurikulum, dan Asesmen Pendidikan Kementerian Pendidikan Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi.

Basari, A. (2014). Penguatan kurikulum muatan lokal dalam pembelajaran di sekolah dasar. *Seminar Nasional Ilmu Pendidikan UNS 2014*.

BNPB. (2024a). *Buku kebencanaan Indonesia*. Badan Nasional Penanggulangan Bencana.

BNPB. (2024b). *Risiko kebencanaan*. Inarisk.Bnpb.Go.Id.

Darsiharjo, M. S. (2013). Pendidikan berwawasan lingkungan. In *http://file.upi.edu/Direktori/FPIPS/LAINNYA/DARSIHARJO/FILE_15_SEMINAR_NASIONAL_2007.pdf*.

Desfandi, M. (2014). *Urgensi kurikulum pendidikan kebencanaan berbasis kearifan lokal di Indonesia. Sosio Didaktika: Social Science Education Journal, 1 (2)*.

Eraku, S. S., Ntelu, A., Hinta, E., & Baruadi, M. K. (2023). Urgensi pembelajaran mitigasi bencana alam melalui kearifan lokal pada guru PAUD. *Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini*, *7*(6), 7097–7108.

Fujioka, T., & Sakakibara, Y. (2018). *School education for disaster risk reduction in Japan after the 2011 Great East Japan Earthquake and Tsunami (GEJET). Terrae Didat 14 (3): 313–319*.

Gong, Q., Duan, Y., & Guo, F. (2021). Disaster risk reduction education in school geography curriculum: Review and outlook from a perspective of China. *Sustainability*, *13*(7), 3963.

Havwina, T., Maryani, E., & Nandi, N. (2017). Pengaruh pengalaman bencana terhadap kesiapsiagaan peserta didik dalam menghadapi ancaman gempabumi dan tsunami. *Jurnal Geografi Gea*, *16*(2), 124–131.

Hidayah, L. N., Hasjim, N., & Al-Ma'ruf, A. I. (2022). Nilai karakter nasionalis dan gotong royong dalam novel Guru Aini Karya Andrea Hirata. *Diglosia: Jurnal Kajian Bahasa, Sastra, Dan Pengajarannya*, *5*(2), 473–488.

Intan, G. (2021). Indonesia masuk daftar 35 negara paling rawan bencana di dunia. *https://Www.Voaindonesia.Com/a/Indonesia-Masuk-Daftar-35-Negara-Paling-Rawan-Bencana-Di-Dunia/5801062.Html*.

Karimah, A., Aslamawati, Y., & Susandari, S. (2021). Pengaruh pelatihan moral knowing terhadap peningkatan moral action dalam mendidik anak. *Schema: Journal of Psychological Research*, 27–35.

Mardiani, L. Y., & Nugraha, S. (2023). Kesiapsiagaan masyarakat terhadap megathrust di Kelurahan Sidoharjo dan Desa Sedeng Kecamatan Pacitan Kabupaten Pacitan. *Indonesian Journal of Environment and Disaster*, *2*(2), 178–186.

Peraturan Daerah Yogyakarta Nomor 3 Tahun 2023 tentang penanggulangan bencana daerah, https://peraturan.bpk.go.id/Details/272631/perda-kota-yogyakarta-no-6-tahun-2023 (2023).

Peraturan Menteri Pendidikan Dan Kebudayaan Republik Indonesia Tentang Penyelenggaraan Satuan Pendidikan Aman Bencana (2019)

Peraturan Presiden 87 Tahun 2020 Tentang Rencana Induk Penanggulangan Bencana 2020-2044 (2020).

Peraturan Wali Kota Malang Nomor 28 Tahun 2023 Tentang Kegiatan Mitigasi Bencana, https://jdih.malangkota.go.id/laravel/storage/upload_file_hukum/Salinan%20Perwal%20No%2028%20Tahun%202023%20ttg%20Kegiatan%20Pelaksanaan%20Mitigasi%20Bencana.pdf (2023).

Permendikbud Nomor 79 Tahun 2014 Tentang Muatan Local (2014).

Rencana Jangka Menengah Nasional 2021-2024 (2020). https://bappelitbangda.purwakartakab.go.id/assets/upload/dokumen/26019e0992845a52a6 df75e8693da2c5.pdf I am running a few minutes late; my previous meeting is running over.

Rencana Strategis Direktorat Pendidikan Sekolah Dasar 2021-2025 , http://ditpsd.kemdikbud.go.id/upload/filemanager/download/laporan/RENSTRA%20DITS D_310121.pdf (2021).

Undang-undang nomor 20 tahun 2003 tentang Sistem Pendidikan Nasional. (n.d.).

Undang-Undang Nomor 24 Tahun 2007 Tentang Penanggulangan Bencana .

Wilson, N., Valler, V., Cassidy, M., Boyd, M., Mani, L., & Brönnimann, S. (2023). Impact of the Tambora volcanic eruption of 1815 on islands and relevance to future sunlight-blocking catastrophes. *Scientific Reports*, *13*(1), 3649.