AIWEST - DR 2023

15th Aceh International Workshop and Expo on Sustainable Tsunami Disaster Recovery

PROGRAMME BOOKLET

FACULTY OF PSYCHOLOGY
UNIVERSITAS GADJAH MADA,
YOGYAKARTA, INDONESIA

11- 13 OCTOBER 2023

Updated: 6 October '23

Welcome

On behalf of the organising committee of the 14th Aceh International Workshop and Expo on Sustainable Tsunami Disaster Recovery (AIWEST-DR 2023), we extend our warmest welcome to you in Yogyakarta! It is a great honor for us to serve as the hosts of this year's conference. The opportunity to come together in person is indeed exciting, fostering the rekindling of collaborations, while still broadening accessibility through online participation in a hybrid format.

This year's overarching theme places a spotlight on "Adaptive and Sustainable Resilience to Disaster," highlighting reflections stemming from the post-pandemic disruption. The conference coincides with this year’s Mid-Term review of the Sendai Framework for Disaster Risk Reduction. As such, it aims to discuss ways to de-center disaster risk reduction and reflect on its progress in adaptive and sustainable manners. Consequently, we have diligently curated a programme that mirrors the growth of our community dedicated to achieving such a purpose.

In addition to the local organising committee at the Faculty of Psychology, Universitas Gadjah Mada, we extend our gratitude to our esteemed partners at the Tsunami and Disaster Mitigation Research Center (TDMRC) at Universitas Syiah Kuala, the International Research Institute of Disaster Science (IRIDeS) at Tohoku University, the University of Sydney, Poltekkes Kemenkes Mamuju, Cerdas Antisipasi Risiko, and Yakkum Emergency Unit for their invaluable support in orchestrating this year's conference. We would also like to express our gratitude to our sponsors, Komatsu, Nakamura, and Paragon Corp; their unwavering support and commitment have been instrumental in bringing us all together today.

Finally, It is our fervent hope that you will find immense value in the conference programme, have the opportunity to reconnect with familiar faces, and establish new connections amidst the enchanting backdrop of Yogyakarta's cultural richness and charm.

Dr Pradytia Pertiwi
Chair of AIWEST-DR 2023

Venue

Online

Zoom link:

http://ugm.id/AIWESTDR23Sessions
Meeting ID: 896 2749 2168
Passcode: aiwestdr

Internet:

Wifi: UGM-HOTSPOT
internet.ugm.ac.id -> guest login
User: seminar08@ugm.ac.id
Password: psikologiugm

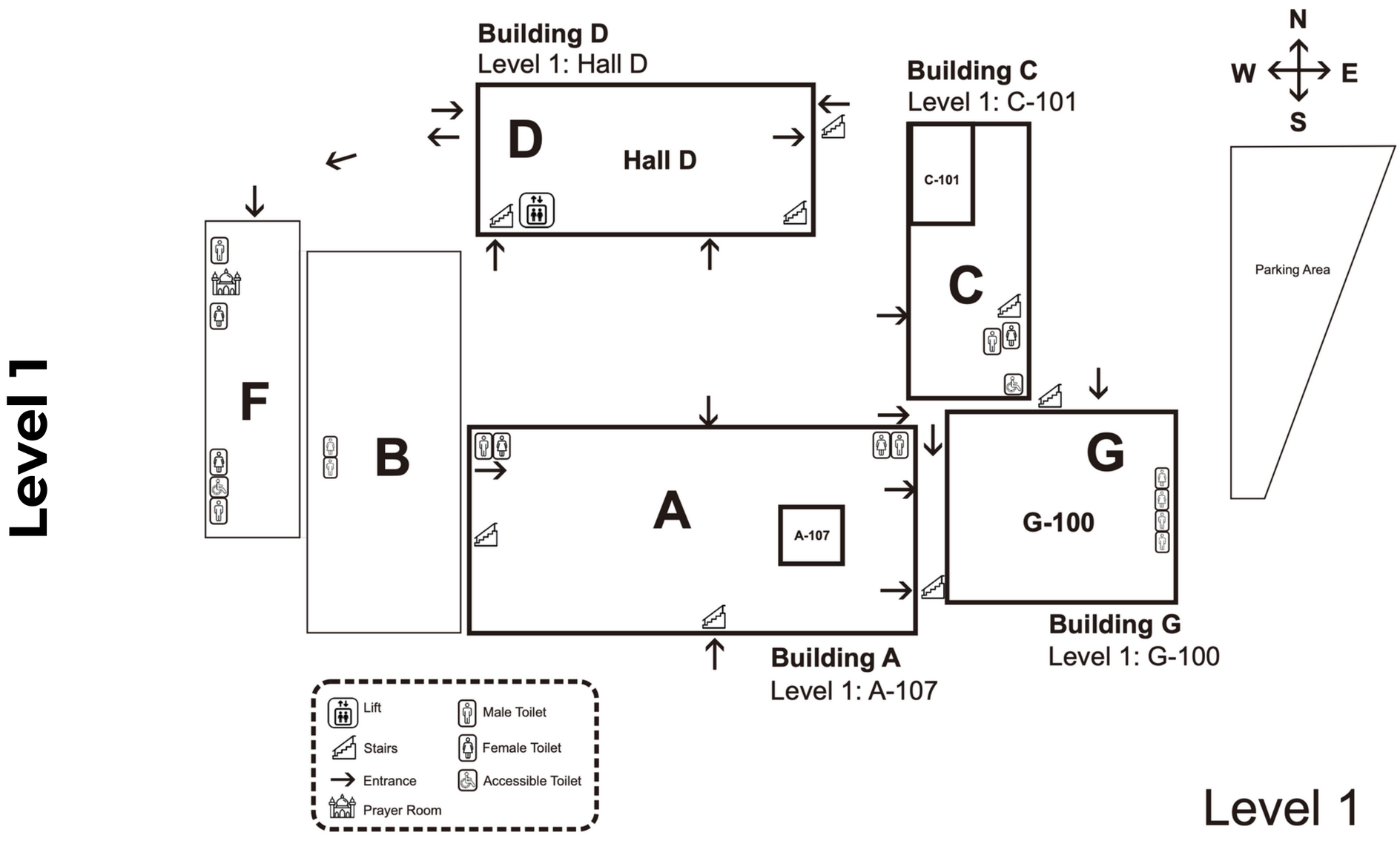
In Person

University Club UGM Room Bulaksumur (Level 1)
https://maps.app.goo.gl/1XfeCZv7q2hZ7XoG6

In Person

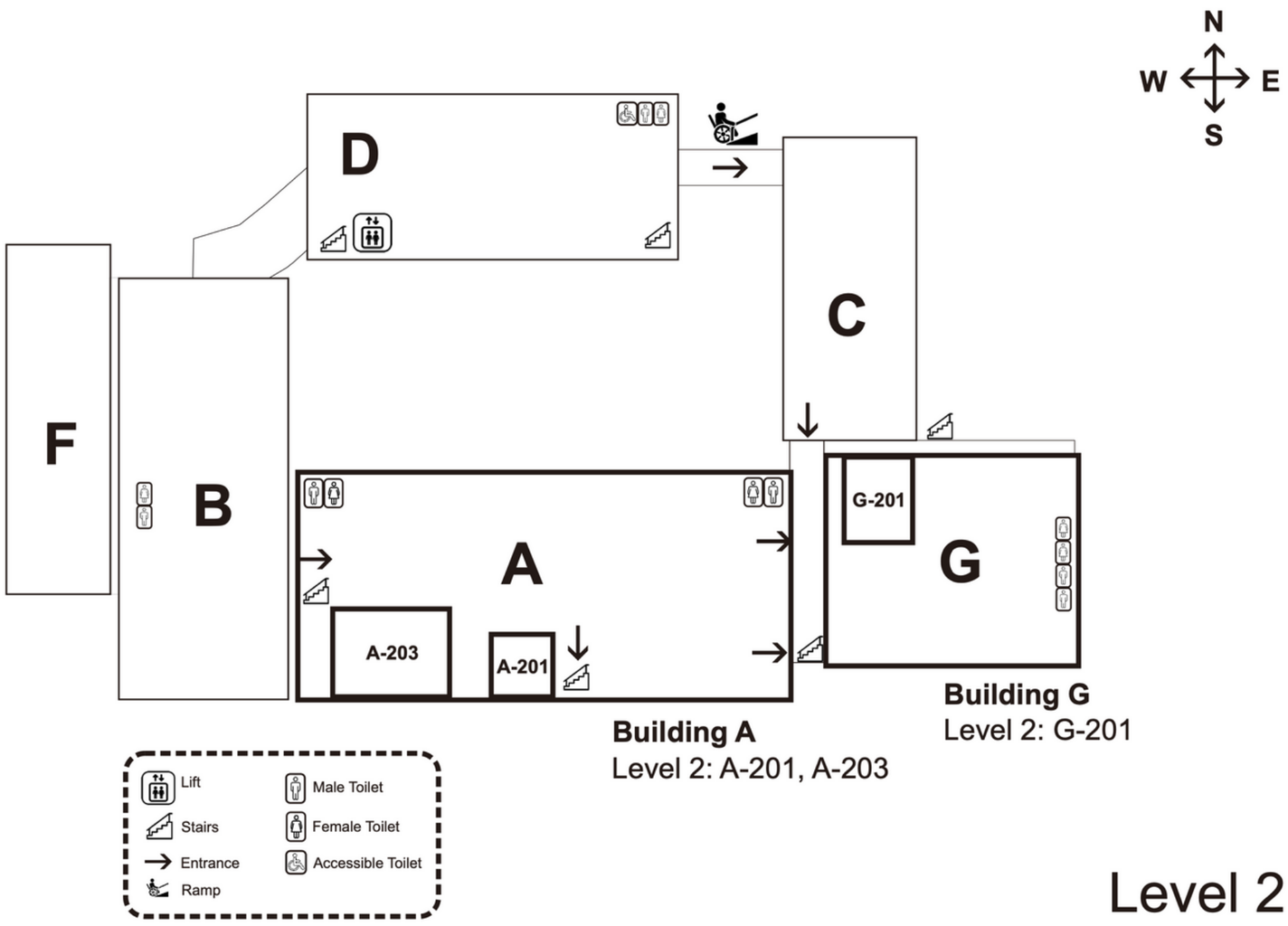
Faculty of Psychology UGM
https://maps.app.goo.gl/1XfeCZv7q2hZ7XoG6

Floor plan



Level 1

Level 2

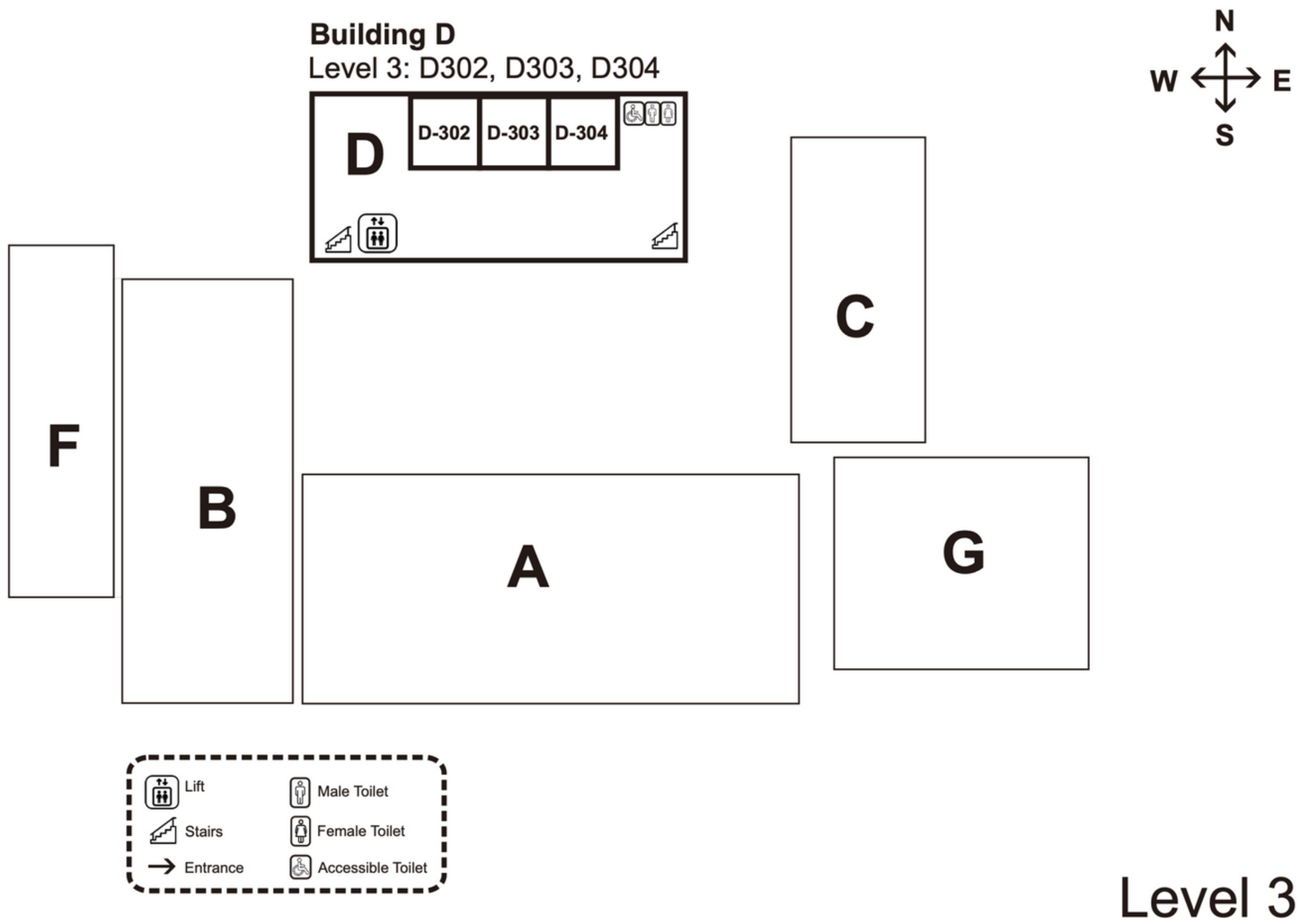


Building A
Level 2: A-201, A-203

Building G
Level 2: G-201

Level 2

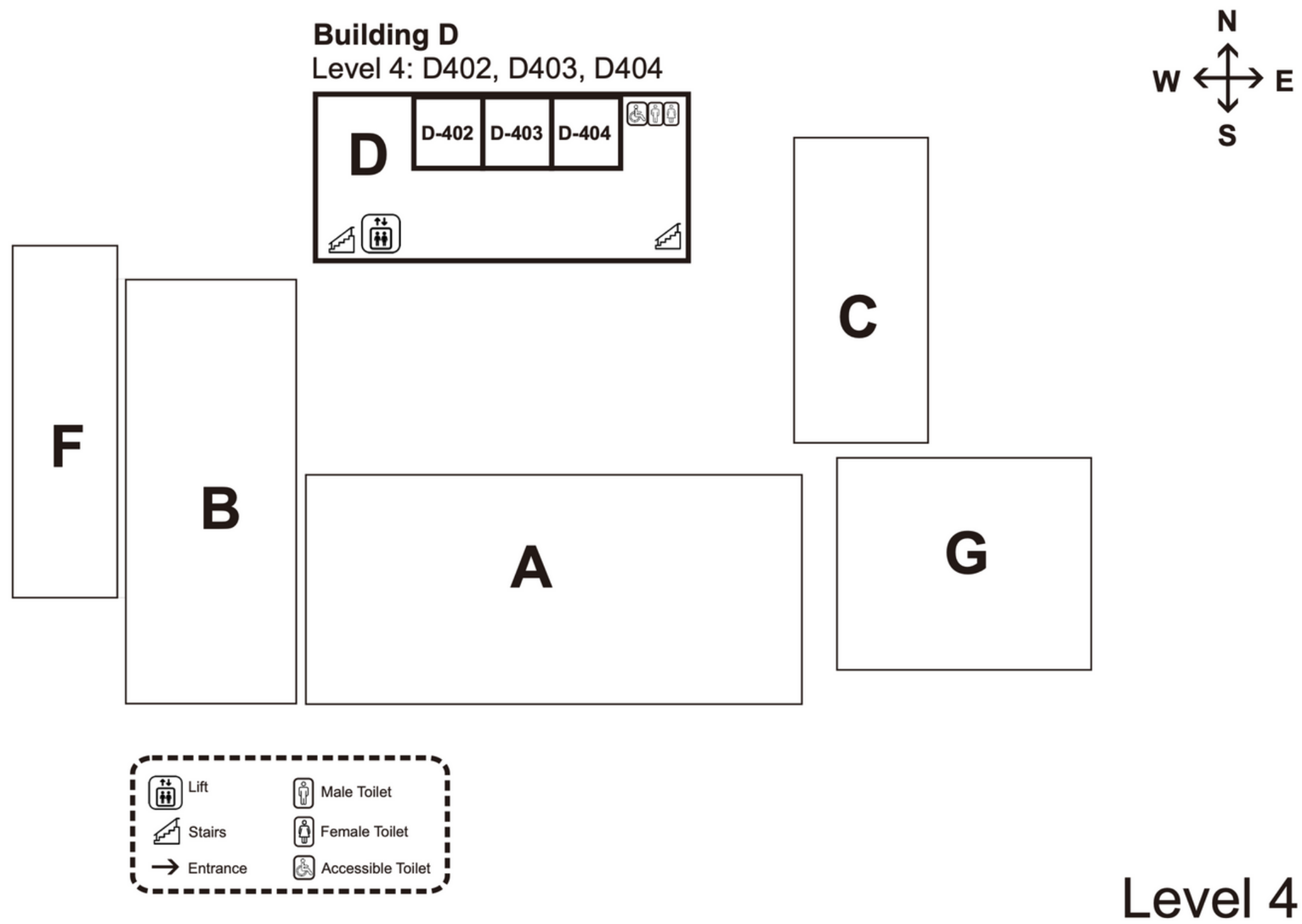
Level 3



Building D
Level 3: D302, D303, D304

Level 3

Level 4



Building D
Level 4: D402, D403, D404

Level 4

CONFERENCE PROGRAMME

Below is an overview of the conference schedule, for a full schedule please visit the conference website: https://aiwestdr.psikologi.ugm.ac.id/conference-schedule/

Note: Time is shown in Western Indonesia Time (GMT+7)

Pre-Event, 7 October 2021

Time	Session	Description	Room (hybrid)
08.00-17.00	**Case study collection**	Symposium & Expo IDEAKSI/CLIP Programme and case study collection presentation Day	**G-100 & D-100**

Day 1, 11 October 2023

Time	Session	Description	Room (hybrid)
8.00		Registration	**University Club UGM**
		Main session	
9.00-9.30	**Opening remarks**	Welcoming remarks: 1. Prof. dr. Ova Emilia, M.Med.Ed., Sp.OG(K)., Ph.D (Rector, Gadjah Mada University) 2. Prof. Dr. Ir. Marwan (Rector, Universitas Syiah Kuala)	
9.30-10.30		Keynote 1: Adaptive and Resilient Society Prof. Ir. Dwikorita Karnawati, M.Sc. Ph.D	
10.30-11.00	**Break**	Coffee break and group photo	
11:00 - 12.30	**Panel session**	Invited speakers: 1. Dr. Raditya Jati, S.Si., M.Si (Indonesia Disaster Management Agency [BNPB]) 2. Emiliano Rodriguez Nuesch (Pacifico Creative Risk Communication, Argentina) 3. Ms Marc Jacob (United Nations for Disaster Risk Reduction [UNDRR] Geneva) 4. Prof Syamsidik (TDMRC, USK)	

Time	Session	Description	Room (hybrid)
12:30 - 13.30		Lunch	**University Club UGM**
13:30-14.45		**Parallel session 1**	**Faculty of Psychology UGM**
		Track 1	
	Room 1	Group 1-A	**D-302**
	Room 2	Group 1-B	**D-303**
		Track 2	
	Room 3	Group 2-A	**D-304**
	Room 4	Group 2-B	**D-402**
	Room 5	**Group 2 - C**	**D-403**
	Special session		**Faculty of Psychology UGM**
13.30 - 15.30	**Room 7**	Special session 1	**G-100**
14.45 - 15.30	**Break**	Coffee break	**D-hall**
15.30 - 16.45		**Parallel session 2**	**Faculty of Psychology UGM**
		Track 1	
	Room 1	Group 1-C	**D-302**
	Room 2	Group 1-D	**D-303**
	Room 3	Group 1-E	**D-304**
		Track 2	
	Room 4	Group 2-D	**D-402**
	Room 5	Group 2-E	**D-403**
15.30 - 17.00	**Special session**		**Faculty of Psychology UGM**
	Room 7	Special session 2	**G-100**
	Room 8	Special session 3	**C-101**

Day 2, 12 October 2023

Time	Session	Description	Room (hybrid)
	Main session		**Faculty of Psychology UGM**
09.00-09.15	**Opening**	Opening by MC	**G-100**
09.15-10.15	**Main session**	Keynote speech: Prof. Shinichi Kuriyama (Director of International Research Institute of Disaster Science - IRIDeS Tohoku University)	**G-100**
10.15-10.30	**Break**	Coffee break	**D-hall**
10.30-11.45		**Parallel session 3**	**Faculty of Psychology UGM**
		Track 1	
	Room 1	Group 1-F	**D-302**
	Room 2	Group 1-G	**D-303**
	Room 3	Group 1-H	**D-304**
		Track 2	
	Room 4	Group 2-F	**D-402**
	Room 5	Group 2-G	**D-403**
	Room 6	Group 2-H	**D-404**
10.30-13.00	**Special session**		**Faculty of Psychology UGM**
	Room 7	Special session 4	**G-100**
	Room 8	Special session 5	**C-101**
	Room 9	Side Event Hands-On Workshop	**A-203**
11.45-13.00	**Lunch**	Lunch buffet	**D-hall**

Time	Session	Description	Room (hybrid)
13.00-14.15		**Parallel session 4**	**Faculty of Psychology UGM**
		Track 1	
	Room 1	Group 1-I	**D-302**
	Room 2	Group 1-J	**D-303**
		Track 3	
	Room 3	Group 3-A	**D-304**
		Track 4	
	Room 4	Group 4-A	**D-402**
	Room 5	Group 4-B	**D-403**
	Special session		**Faculty of Psychology UGM**
	Room 8	Special session 5	**C-101**
	Room 9	Side Event Hands-On Workshop	**A-203**
14.30-15.45		**Parallel session 5**	**Faculty of Psychology UGM**
		Track 1	
	Room 1	Group 1-K	**D-302**
		Track 4	
	Room 2	Group 4-C	**D-303**
	Room 3	Group 4-D	**D-304**
	Room 4	Group 4-F	**D-402**
		Track 5	
	Room 5	Group 5-A	**D-403**
	Room 6	Group 5-B	**D-404**
14.30-15.45	**Special session**		**Faculty of Psychology UGM**
	Room 8	Special session 5	**C–101**
	Room 9	Side Event Hands-On Workshop	**G-201**
15.30-15.45	**Coffee break**		**D-hall**

Time	Session	Description	Room (hybrid)
15.45-17.00		**Parallel session 6**	**Faculty of Psychology UGM**
		Track 4	
	Room 1	Group 4-E	**D-302**
	Room 2	Group 4-F	**D-303**
		Track 6	
	Room 3	Group 6-A	**D-304**
	Room 4	Group 6-B	**D-402**
	Room 5	Group 6-C	**D-403**
		Track 3	
	Room 6	Group 3-B	**D-404**
15.45-17.00	**Special session**		**Faculty of Psychology UGM**
	Room 8	Special session 5	**C-101**
17.00 - 17.45		Departure to conference dinner	**D-Hall**
17.45 - 18. 45	**Conference Dinner**	Conference dinner	**Chandari Heaven**
18.45 - 19.30		Departure to Ramayana Dance	
19.30 - 21.00		Ramayana Dance at Prambanan Temple	**Prambanan**
21.30 - 22.30		Back to Venue	**D-hall**

Day 3. 13 October 2023

Time	Session	Description	Room (hybrid)
08.00 - 08.30		Depart to Field Visit	**D-Hall**
08.30-10.30		Field Visit	**Gadjah Wong River**
10.30-11.00		Back to Psychology UGM	
11.00-11.30	**Closing**	Closing	**G-100**

Day 1

11 October 2023

Parallel Session 1

13.00 - 14.15

Track 1 :
Hazard, Technology & Infrastructure

Room 1 (D-302) Group 1-A

Moderator :
Dr. Yunita Idris

Microzonation of the seismically active region along the Seulimum fault

Zihan Ireuneu Syarani, Umar Muksin, Nadiatul Asra, Agussabti Agussabti, Muhammad Dirhamsyah

Abstract

Building structures seismic vulnerability assessment requires a building fragility curve, which could be derived from data on building damage caused by earthquakes. A fragility curve represents the probability of a typical level of building damage at a specific seismic intensity in a particular region. The availability of building fragility curves of typical Indonesian residential houses or building is limited, so researchers often use fragility curves developed by the Global Earthquake Model (GEM) for their analysis. These curves are selected based on the construction type groups and are assumed to represent buildings in Indonesia. However, this approach cannot fully capture the local context, leading to potential overestimation in vulnerability assessments. This study aims to develop building fragility curves using various rapid assessment models visually. The data used in this study are based on rapid survey data for masonry buildings, which are validated using criteria and damage assessment forms developed by the Federal Emergency Management Agency (FEMA) for damaged buildings in the 2022 Cianjur earthquake event. The results show that the empirical probability values for building damage levels are lower compared to the analysis using simulation models. Therefore, building reinforcement is necessary to reduce the risks posed by earthquakes.

Seismic vulnerability of the Campus II Universitas Syiah Kuala

Nadiatul Asra, Saidinal Fuhtra, Umar Muksin, Haekal Azief Haridhi

Abstract

Universitas Syiah Kuala (USK) is planning to develop a new campus (Campus II). The location of the study area is relatively close to the Seulimum fault which historically has generated a devastating earthquake. Therefore, a seismic vulnerability study is important to conduct in use for reference before the development. This study aims to determine the seismic vulnerability index in the Campus II development area of USK in Mesjid Raya District, Aceh Besar Regency using a Horizontal to Vertical Spectral Ratio (HVSR) method. Potential earthquake damage can be studied by analyzing the dominant frequency (f0), amplification (A0), seismic vulnerability (Kg), and Vs 30. The microtremor acquisition was carried out by using a Broadband seismometer with 100 sps at 37 measurement points with a distance of 500 meters for each station. We use the Geopsy software to analyze seismic data by applying Fourier transform and STA/LTA concept to Rayleigh waves and obtain the dominant frequency value. The 1D velocity inversion was derived by Dinver using the Neighborhood Algorithm (NA). The results of the analysis show that the dominant frequency value is higher around the STA17 point, while the amplification value and seismic vulnerability are highest in the north (at STA2 and STA3) and in the south (at STA28, STA29, and STA30). The higher amplification region is associated soft soil identified as alluvium (Qh). On the other hand, the 1D inversion results at a depth of 30 shows Vs values of 661.142 - 1106.31 m/s (at STA3 and STA17) which indicates the presence of bedrock, making it suitable for future development although more detail investigation is required.

Vigilant: Validation of Post-Earthquake Rapid Building Damage Assessment Models for Empirical Fragility Curve Development

Yunita Idris, Haikal Fajri, Muttaqin, Adrian Ulza

Abstract

Building structures seismic vulnerability assessment requires a building fragility curve, which could be derived from data on building damage caused by earthquakes. A fragility curve represents the probability of a typical level of building damage at a specific seismic intensity in a particular region. The availability of building fragility curves of typical Indonesian residential houses or building is limited, so researchers often use fragility curves developed by the Global Earthquake Model (GEM) for their analysis. These curves are selected based on the construction type groups and are assumed to represent buildings in Indonesia. However, this approach cannot fully capture the local context, leading to potential overestimation in vulnerability assessments. This study aims to develop building fragility curves using various rapid assessment models visually. The data used in this study are based on rapid survey data for masonry buildings, which are validated using criteria and damage assessment forms developed by the Federal Emergency Management Agency (FEMA) for damaged buildings in the 2022 Cianjur earthquake event. The results show that the empirical probability values for building damage levels are lower compared to the analysis using simulation models. Therefore, building reinforcement is necessary to reduce the risks posed by earthquakes.

High-Angle Normal Fault Activity on Seram Island Revealed by the 2021 Mw 6.0 Tehoru Earthquake and Its Aftershocks

Gatut Daniarsyad, Priyobudi Priyobudi, Aprilia Puspita Cahyaningrum, Dayu Gigih Wibisono, Sesar Prabu Dwi Sriyanto, Bayu Pranata1, Indra Gunawan, Iman Fatchurochman and Daryono

Abstract

Seram Island is the northern part of the Banda subduction which is characterized by the existence of a thrust fault structure in the Seram Trench as the main contributor to seismicity in this region. Complex tectonic activity also forms a deformation zone of the Kawa Fault with a sinistral strike slip mechanism and high-angle normal faults in the mainland. On June 16, 2021 a Mw 6.0 earthquake occurred on the south coast of Seram, in Tehoru to be precise, which followed by a 51 cm high tsunami wave which is thought to have been generated by an underwater landslide. This earthquake has a normal fault mechanism which is quite rare on Seram Island, however, the actual fault plane that caused the earthquake is still unknown. To solve this problem, we performed a seismicity analysis using well relocated hypocenter of the mainshock and the aftershocks sequence. We use the double-difference relocation method with the SVD algorithm performed in the hypoDD program. The results show the distribution of aftershocks that form a northeast-southwest trending lineation. The depth of the hypocenter has also improved from being dominated by fixed depth to being varied with dominance at depths of 8-14 km. An important feature of the relocation results is that the fault structure is well delineated showing lineation of the structure with a steep dip of ~50° to the southeast. The northeast-southwest oriented lineation is thought to be associated with high-angle normal faulting activity which indicates a northwest-southeast trending tensional regime in the south of Teluti Bay. A small strike-slip component on the source mechanism of the mainshock is validated by a 11 mm northward surface displacement from the geodetic observation. The results of this study indicate the activeness of the tensional regime on Seram Island which can be used as a basis for seismic hazard assessment.

Parallel Session 1

13.00 - 14.15

Track 1 :
Hazard, Technology & Infrastructure

Room 2 (D-303) Group 1-B

Moderator :
Dr. Ella Meilianda

Making Virtual Reality (VR)/ Augmented Reality (AR) Possible to Strengthen Disaster Risk Reduction among Community at Risk of Tsunami

Gusti Ayu Ketut Surtiari, Syarifah Aini Dalimunthe, Abdul Fikri Angga Reksa, Dicky Pellupessy, Ari Purwanto Sarwo Prasojo, Yasuhito Jibiki, Taro Arikawa

Abstract

This paper aims to seek a deeper understanding of the intention to use Virtual Reality (VR)/Augmented Reality (AR) to strengthen disaster risk reduction using the technology acceptance model (TAM) among people at risk of a tsunami. Kuta, Bali-Indonesia, is selected as a case study regarding its high risk of tsunami and dense tourism activities. Data is collected by interviewing 148 households living along the coast who were selected purposively based on the hazard map of the tsunami and the location of tsunami drills in the past, including the proportion of migrants and non-migrants. Study shows that technology is needed to better prepare for future risks of tsunamis. Despite having experience in tsunami drills, understanding evacuation routes still needs to improve. People perceived VR/AR could provide integrated knowledge and information about tsunamis, including evacuation routes and shelters. Moreover, the VR/AR technology is also perceived to complement existing knowledge and information about coastalprotection generated from ecosystem services. The result shows that the intention to use VR/AR is described by the perceived usefulness and perceived ease to use. Significant differences appear among different agegroups and are not merely based on migrant's status. This study has an essential impact on policymakers,particularly in proposing the implementation of VR/AR to plan disaster risk reduction effectively.

Application of Spatial Model for Potential Flood Hazard Susceptibility at Trumon Area, South Aceh Regency of Indonesia

Ella Meilianda, Dedy Alfian, Fitri Z. Nurnalisa, Maimun Rizalihadi

Abstract

Indonesia is currently embarking on a transition from a ‘risk retention’ to a ‘risk transfer’ strategy for managing the impact of disaster events. The risk transfer strategy, i.e., insurance policy and protection, requires high-level preliminary risk assessment, which requires detailed attention and analysis in producing hazard mapping. Improvement of methods requires, preferably, the non-deterministic index method in a GIS environment, to produce reasonably good quality hazard susceptibility mapping. Recently, a new spatial method has been developed to improve the parameterization of the spatial analysis method for watershed-scale flood hazard susceptibility mapping. Those parameters, which include the Topographic Wetness Index (TWI), Rainfall Intensity (R), Distance to rivers (D), Altitude (A), Land use (L), and Soil type (S), configure the proposed method called “TWIRDALS”. The present study aims at testing the spatial model TWIRDALS watershed at the Trumon Area, South Aceh Regency, Sumatra Island, Indonesia. Historical flood events associated with the watershed have escalated over the last 25 years in the Trumon watershed. Several steps of geospatial analysis in this study use multi-temporal satellite imagery from 1995 to 2021 to identify area changes in land use rendering over the watershed. The satellite imagery interpretation reveals a remarkable land use change, particularly of the previously 2130 ha of peatland forest observed in 1996, to become a 10,000 ha palm oil plantation in 2021. This current situation has made the Trumon area the recipient of more frequent floods, i.e., from a five-year return period to an annual event.

Sustainable and Climate Resilience Ecotourism on the East Coast of Aceh Kuala Langsa Mangrove Forest

Nur Khalida, Haekal Azief Haridhi, Rina Suryani Oktari, Saumi Syahriza

Abstract

The development of sustainable and climate-resilient ecotourism on the east coast of Aceh, especially the mangrove forest in Kuala Langsa, has an important role in climate change mitigation efforts. Mangrove forests in this area offer high biodiversity and function as an effective carbon sink. The Kuala Langsa mangrove forest ecotourism area is 6014 Ha, consisting of various types of mangrove species and various fauna that live in this ecosystem. This study aims to analyze the development of sustainable and climate-resilient ecotourism on the east coast of Aceh, with a focus on mangrove forests in Kuala Langsa, in the application of climate change mitigation actions such as conservation or planting Mangrove seeds in the Kuala Langsa Mangrove forest ecotourism area as an effort to reduce disaster risk and climate change mitigation and analyzing aspects of sustainable tourism such as; empowering/involving local communities in every activity in the mangrove forest ecotourism city of Langsa. The research method used includes data collection through field observations and interviews with relevant stakeholders in Langsa, such as; representatives from PT PEKOLA (Perseroda), the Department of Environment and Forestry, Development Planning Agency (BAPPEDA), Youth, Sports and Tourism Office (DISPORA), Meteorological, Climatological, and Geophysical Agency (BMKG), Head of Villages, the community around the mangrove forest ecotourism, and visitors/tourists. This study also analyzed several literature studies to obtain extensive information from previous studies regarding Mangrove forest ecotourism as sustainable and climate-resilient tourism. The collected data is analyzed qualitatively to understand the dynamics of sustainable ecotourism development and climate resilience in this region in the context of climate change mitigation. The results show that there is significant potential for environmental preservation and climate change mitigation efforts that have been integrated into ecotourism development, including through sustainable management, education and public awareness, as well as cooperation between government, communities and the tourism sector. Keywords: mangrove forest ecotourism, sustainable tourism, climate resilience, sustainable cities and communities.

Analysis of likelihood and impact of flood risk on community food security in Aceh Besar

Miftahudin, Sofia, Silvy Amelia Siregar, Saumi Syahreza

Abstract

Identification results through Central Statistic Agency data show that the five districts in Aceh (Aceh Utara, Pidie, Aceh Besar, Aceh Timur, and Bireuen) which produced an immense amount of rice production in the last four years. However, it is being concerned that during the last five years, the five districts have experienced a decline in rice productivity. In order to minimize the losses that will occur, it is necessary to do forecasting as an anticipatory step against climate change, wuth method used is the Seasonal Vector Autoregressive Moving Average (S-VARMA), and risk measurement uses the Probability Impact Matrix (PIM) method. Aceh Besar district is the second largest region with agricultural land area after Aceh Utara, where climate change has resulted in decreased food production and increased frequency of crop failures. The results obtained in this study were that the S-VARMA(1,0,1)(1,1,1)30 was the best model with an AIC value of 11.38. Forecasting errors obtained based on MAPE values for rainfall, air temperature, wind speed, and humidity are 8.36%, 1.21%, 3.75%, and 2.09%, respectively. The agricultural sector's contribution has impacted the District's Gross Regional Domestic Product, which has decreased in the last two years. The PIM method revealed that 3 out of 9 risks have a high and moderate level of risk. The highest risk caused by a flood disaster is food prices that have soared in the market due to crop failure experienced by farmers, with a risk importance level of 25. This condition is risky in maintaining the food security of the community where the district is the largest rice granary.

Parallel Session 1

13.00 - 14.15

Track 2 :
Inclusive Community Resilience and Disaster Education

Room 3 (D-303) Group 2-A

Moderator :
Dr. Rina Suryani Oktari

How secure are persons with disabilities in a disaster? A quantitative assessment of Indonesia socio economic survey

Utami Diah Kusumawati, Puspita Anggraini Kaban, Yulies Puspitaningtyas, Imama Lavi Insani, Pradytia Pertiwi

Abstract

Persons with disabilities in Indonesia remain experiencing deplorable conditions ranging from education to social protection. However, the scope of benefits of the social protection system for at-risk groups including disabled people remains limited. Evidence on the outreach of persons with disabilities in the social protection system has also not been mapped. As such, scientific evidence to inform social protection planning for disabled people in disaster situations is currently lacking. This quantitative study aims to understand the extent to which persons with disabilities are likely to be socially secured in disaster situations by investigating access to social protection schemes. Using the data from SUSENAS 2020, five categories of social protection schemes are used to construct a Social Protection Index of persons with disabilities living in disaster-risk local areas. Meanwhile, another data, the 2020 Indonesia Disaster Risk Index (IRBI) is used to map the level of disaster risk of regions. The finding shows that 43.9% of persons with disabilities live at high risk of disaster and only 17.6% potentially be highly secured in disasters. Furthermore, among the five categories, BPJS Kesehatan is found as the most contributing program for disabled people during a disaster. Persons with disabilities are found to be 1.14 more likely to be slightly secured in disasters than those without disabilities. As such, there is an urgent need to cover the gaps of provision of social protection schemes for persons with disabilities in high-risk of disasters. Considering planning of such arrangement in pre-disaster situation is also warranted.

Designing Media Education for Children with Hearing Disability in SLB Negeri Banda Aceh

Nur Ikhsani Rahmatika, Zahrani, Meilya Silvalila

Abstract

Banda Aceh, a coastal city located in the western most province of Indonesia, has long been known for its stunning natural beauty and vibrant cultural heritage. Situated on the northern tip of Sumatra Island, this bustling city is surrounded by the vast expanse of the Indian Ocean on one side and picturesque hills on the other. However, beneath its picturesque facade lies an alarming reality - Banda Aceh stands perilously exposed to a high risk of disaster. With the history of disasters in Aceh which is one of the biggest disasters that has caused many casualties, education related to disaster awareness needs to be carried out. People with hearing disabilities are one of the vulnerable groups in the event of a disaster. Education related to disaster awareness is a form of non-structural mitigation which at this time has been widely carried out both in formal education in schools and campuses and informally in the community. Efforts to increase disaster awareness through education are important, including for groups with disabilities. As a group with hearing impairments, they are at greater risk when a disaster occurs because they cannot hear warnings through sound media and the communications gap. However, with disaster awareness through education, people with disabilities are also expected to be able to carry out independent evacuations and save themselves when a disaster occurs. This research aimed to explore the effectiveness of designing disaster media education for children with disabilities in Banda Aceh, Indonesia. Recognizing the unique vulnerabilities of children with disabilities during disasters, the study focused on developing an inclusive and accessible media-based educational program. The method used in the research is qualitative research and encompassed various stages, including needs assessment, program development and implementation. Designing disaster media education for children with disabilities in Banda Aceh proved to be an effective and essential approach to bridge the education gap and enhance disaster preparedness among this marginalized group. The research outcomes emphasize the importance of inclusive and accessible education in disaster management, aiming to ensure the safety and well-being of all children, regardless of their abilities. The findings of this research contribute to the growing body of knowledge on disability-inclusive disaster education and provide a basis for future program development and policy-making in disaster management in Banda Aceh and beyond.

Content Analysis of Disaster-related Lessons in the 2013 Curriculum and the Merdeka Curriculum in Senior High Schools

Tasya Ainan Salsabila, Sulastri, Rina Suryani Oktari, Mirza Desfandi

Abstract

Disaster education in schools can be implemented in various ways, including integration into the curriculum. During the pandemic, the learning system in schools in Indonesia underwent many changes, one of which was the implementation of the Merdeka Curriculum (or Independent Curriculum) from the previous 2013 Curriculum. This study aims to analyze how disaster education is integrated into Curriculum 13 and the Merdeka Curriculum at the senior high school level. Specifically, this study aims to: i) explore the teaching strategies, methods and approaches applied in both curricula to convey disaster preparedness values to students. ii) identify the weaknesses and strengths of each curriculum in integrating disaster education to reveal aspects that need to be improved and improved, iii) provide recommendations to improve the integration of disaster education in both curricula, identify more effective teaching methods, add material or content relevantly, or change the overall approach. The study was conducted in several stages to conduct content analysis to compare the integration of disaster education in Curriculum 13 and the Merdeka Curriculum. First, identify the fundamental differences between Curriculum 13 and Merdeka Curriculum in terms of structure, focus, and approach used. Second, identify relevant curriculum parts for integrating disaster education into Curriculum 13 and Merdeka Curriculum at the senior high school level. Third, identify important categories or dimensions for analyzing the integration of disaster education, such as objectives, content, teaching methods, assessments, and resources used, as well as identifying the weaknesses and strengths of each curriculum in integrating disaster education. This research is expected to encourage increased awareness and the importance of integrating disaster education into the school curriculum. By analyzing the integration of disaster education in curriculum 13 and the independent curriculum, this research is expected to provide a basis for education policymakers to strengthen disaster education in the existing curriculum. Keywords: DRR, quality education, sustainable education, curriculum integration, safe school.

Knowledge About the Health Impact of Climate Change: Does It Makes a Difference to Pro-Environmental Attitudes of Medical Students?

Rina Suryani Oktari, Lia Utari, Zulfitri

Abstract

Human activities contribute the main factors in the global environmental damage. An increased knowledge about climate change in the community will generate a positive impact on pro-environmental behavior. Therefore, performing pro-environmental behavior in daily living is essential. This study aimed to obtain an overview of knowledge about the health impacts of climate change and pro-environmental attitudes among the students of the Faculty of Medicine, Universitas Syiah Kuala. This study will also explore the relational structure of knowledge about the health impacts of climate change and pro-environmental attitudes among the students. This research employed an analytic observational method with a cross-sectional approach. A total sample of 111 respondents who met the inclusion criteria was selected by the stratified random sampling method. The univariate analysis showed that the majority of the respondents (55%) had an excellent level of knowledge and that 49.5% of the respondents showcased an excellent level pro-environmental attitude. Using the Spearman's rank correlation coefficient, a significant positive correlation was found between knowledge about the health impacts of climate change and pro-environmental attitudes ($r = 0.304$, $p = 0.001$). This study highlighted the importance of improving environmental education for medical students to enhance their pro-environmental behavior performance. Hence, there arises a need for policy guidelines along with extensive disaster and environmental education to manage the risk of climate change impacts through pro-environmental attitudes and behavior.

Parallel Session 1

13.00 - 14.15

Track 2 :
Inclusive Community Resilience and Disaster Education

Room 4 (D-402) Group 2-B

Moderator :
Ms. Fega Pangestika

Integrating Disaster Education into School Curriculum in Indonesia: A Scoping Review

Nurul Rahmah Desilia, Jonatan Lassa, Rina Suryani Oktari

Abstract

Indonesia, a country highly susceptible to geological and hydrometeorological disasters, as indicated by the increase in the frequencies and incidents in the last 20 years. The Basic Education Data (DAPODIK) indicated that the school and education systems in the country hosts about 47 million students, over 3.2 million teachers, and 272,000 schools across the nation, of which 250,000 are located in disaster-prone regions. The Directorate General of Education has identified the potential impact of disasters on the education system. This study aims to collect and analyze relevant literature on integrating disaster education into the school curriculum in Indonesia. Key research questions addressed include: i) How has disaster education been integrated into the school curriculum in Indonesia?; ii) What content is generally taught in a curriculum that integrates disaster education?; iii) What model or approach is used to integrate disaster education into the school curriculum?; iv) How is the effectiveness of disaster education in increasing students' knowledge, attitudes, and behavior? and v) Are there any challenges or obstacles in integrating disaster education into the school curriculum? The study also identified gaps in disaster education within the Indonesian curriculum to set an agenda for future research. Relevant literature in both English and Bahasa Indonesia from online sources, specifically Google Scholar and Science Direct databases, have been included for further analysis to explore the latest conditions and complexities in integrating disaster education into the curriculum in Indonesia. Search terms included 'disaster education', 'disaster preparedness schools', 'safe schools, curriculum', 'DRR education' 'comprehensive school safety', SPAB and other relevant keywords. The findings contribute to bridging the gap between research outcomes and practical implementation, providing recommendations for future integration practices. This research is expected to strengthen disaster education in Indonesia, enhance preparedness, and contribute to the broader field of disaster risk reduction.

Developing Green Economy by Disability Community in Preventing Climate Change Impacts in Banda Aceh

Rizanna Rosemary, Ika Ismiati, Marty Mawarpury, Husnul Khatimah

Abstract

This submission is intended for the call for a case study. Abstract Indonesia is included in the 15 countries with the world's most significant plastic waste pollution in 2021. While Banda Aceh, the capital city of Aceh Province, Indonesia, produces up to 576 tons per day, most of which is generated by households. Preventing and handling climate change and environmental damage, such as through comprehensive waste management, has not run optimally in this city. The impact of climate change is marked by an increase in the earth's temperature. It is felt by all levels of society, including minority, vulnerable and marginalized groups such as people with disabilities, which are most affected by this condition physically and mentally. One of the adaptation efforts to climate change is through effective waste management. Students from Universitas Syiah Kuala have invented a waste management innovation, a household waste pick-up app called e-tikbroh.yak (https://instagram.com/e_tikbroh_yak?igshid=MzRlODBiNWFlZA This app works as a liaison from consumers (community) to producers (e-tkbroh.yak partners). Sorted waste based on categories is picked up from the community and then delivered to groups of craftswomen who manage the non-organic waste from food and beverage packages into beautiful and valuable handicrafts such as pencil boxes and bags (https://instagram.com/adtreuse_product?igshid=MzRlODBiNWFlZA==). The demand for these products is high, unfortunately, constrained by the availability of tailors, those who can sew the recycled materials into handicrafts products. Meanwhile, a disability group called Children and Youth Disability for Change (CYDC), under the coordination of Erlina Malinda, has carried out waste management activities during the pandemic and has even used waste fabrics sewn into tote bags. However, these activities need to be improved in its continuation. This community service aims to assist the CYDC group in processing non-organic waste into handicrafts and developing a green economy within the disabled community. This community service will carry out two activities. (1). Working with the ADT Reuse Product craftswomen assisting members of CYCD in making handicrafts from non-organic materials. Their handicrafts will be promoted and sold through the e-tikbroh.yak app. 2. Collaborating with the International Center of Aceh and Indian Ocean Studies (ICAIOS) to discuss with CYDC to develop the e-tikbroh.yak app to be a disability-friendly app. The activities carried out by the e-tikbroh.yak and the ICAIOS hope to assist and support CYDC's economic and social resilience as a form of adaptation to the impacts of climate change. Keyword: Banda Aceh, climate change, green economy, impact, waste management

Roblox-based Tsunami Survival Game: A Tool to Stimulate Early Childhood Disaster Preparedness Skills

Adelia Maulida, Hasnan Hanif, Nadiatul Hikmah, Nauma Laila, Bahrun, Muthmainnah, Rina Suryani Oktari

Abstract

Disaster education for early childhood is crucial, especially in Indonesia, which is located within the Ring of Fire, an area prone to various disasters, including tsunamis. Children are a vulnerable group in disaster situations, as they are susceptible to physical and psychological negative impacts. In this context, a game-based approach becomes an attractive alternative as it combines interactive and enjoyable learning experiences. The objective of this study is to explore the effectiveness of using this game as a means of teaching tsunami preparedness. The Tsunami Survival game has visually appealing, child-friendly graphics and easily understandable elements. This study was conducted at Darul Hikmah Kindergarten in Kajhu Village, Aceh Besar District, focusing on the utilization of a game-based approach, specifically the Roblox-based Tsunami Survival game, to educate and stimulate disaster preparedness skills among 19 children aged 5-6 years. The game has equipped children about the actions to be taken during a tsunami through engaging storytelling and gameplay.

Student Attitude to Earthquake Risk: Role of Motivation and Perception of Risk

Resti Kinanthi, Preti Askunala Wikan, Vinia Anasfisia, Acintya Nurmaya

Abstract

Youth awareness and attitudes toward earthquake disasters can assist disaster risk reduction and management efforts to reduce death and economic loss. Students can become a driving force in reducing earthquake risk if they have the right attitude in dealing with earthquake disaster risk. This research aims to analyze students' attitudes to earthquake risk and the role of motivation and perception of risk towards students' attitudes to earthquake risk. Students have the potential to become a driving force in reducing earthquake risk if they have the right attitude in dealing with earthquake disaster risk. Students can be a driving force in reducing earthquake risk if they have the right attitude in dealing with earthquake disaster risk. This research uses quantitative research methods. The research uses an online survey to collect data from 107 students in Padang City and Surakarta City. Researchers use random sampling to distribute the survey. The variables examined in this study are attitudes toward earthquake risk, motivation, and perceptions of earthquake risk. This study used a questionnaire consisting of 67 questions. Data were analyzed using multiple regression analysis with SPSS 26.00. This study found that students have a high attitude toward earthquake risk. The attitude variable is influenced by motivation and perception of earthquake risk by 62.9%, while other variables outside the model studied influence by 37.1%. The motivation and perception of earthquake risk have a significant effect on the attitude variable. Lastly, the perception and motivational variables have a significant effect on the attitude variable partially.

Parallel Session 1

13.00 - 14.15

Track 2 :
Inclusive Community Resilience and Disaster Education

Room 5 (D-403) Group 2-C

Moderator :
Dr. Muzayin

Assessing the Usability of Knowledge Management Systems for Disaster Education in Indonesia

Nasliati, Mizan Bustanul Fuady Bisri, Rina Suryani Oktari

Abstract

Several website-based knowledge management systems targeted for use by stakeholders related to disaster education already exist. However, there is no information regarding the effectiveness, capability and functionality of the information needs of its users. This study analyzed the existing knowledge management system platform related to disaster education. The desktop review method is used by exploring five usability factors that have a significant effect on website launch: (1) does the website carry out its functions, (2) does it present the necessary information and is easy to understand, (3) is the website reliable, (4) whether graphical user interface and (5) input user interface. The desktop review helps researchers to find out the shortcomings of the previous system. This study proposed a contextual framework based on insights gathered from desktop reviews that are analyzed thematically. Several sites were visited to explore benchmarking content, design, users, as well as knowledge management, including kemdikbud.go.id (Ministry of Education, Culture, Research and Technology), spab.kemdikbud.go.id (National Secretariat of Disaster Safe Education Unit), bnpb.go.id (National Disaster Management Agency), mpbi.info (Indonesian Society for Disaster Management), preparedsiaga.or.id (Siap Siaga), and caribencana.id (CARI! - Smart Anticipation of Disaster Risk). The search keywords used to find the existing knowledge management system platform related to disaster education included “disaster education”, “DRR education”, “disaster preparedness school”, “disaster safe school”, “disaster safe education unit”, “knowledge management”, “repository”, in English and Indonesian. The results of this study have practical implications for designers and developers in building a web-based knowledge management system. Future research can consider solutions and improvements that can be applied to developing knowledge repositories related to disaster education proposed in this research.
Keywords: knowledge management, repository, disaster education, innovation, technology.

Evaluating Interprofessional Education in a Disaster Simulation

Rosaria Indah, Muhammad Ansari Adista, Cut Rizka Rahmi

Abstract

The increasing number of disasters in Indonesia calls for emergency responders to improve their preparedness. One of the efforts to do so is conducting disaster simulation regularly. For several years, Universitas Syiah Kuala has conducted an annual disaster simulation involving students from four health profession schools: The School of Medicine, Psychology, Dentistry, and Nursing. The objectives of this simulation were to provide students with an interprofessional learning experience and to allow students to practice their skills in a simulated disaster. The drill was held over a 3-hour period. It consisted of personal scenarios around a simulated earthquake and tsunami hitting a village on a city's coastline. Three hundred fifty-three students from the four schools worked alongside faculty and professionals from clinical partner sites, and 100 students from the school of medicine also participated as victims. A debrief was conducted following the event. The simulation was evaluated with a survey containing open-and closed-ended questions, and 308 (67%) students participated. The result indicates that most students agreed that the simulation was helpful in obtaining many competencies and improved their attitude toward collaboration with other healthcare professional students. The most agreed competence is on treating patients equally. However, many technical aspects need improvements, such as instructors' support, case design, equipment provision, and team development. Two themes arose from the student comments: collaborating with different occupations, and the learning process was fun. In conclusion, the disaster drill positively impacts the students' interprofessional collaboration competence. This calls for a follow-up to find out about the impact of this event on students' future practices.

Community-Based Disability Inclusive Disaster Mitigation Innovation in Disaster-Prone Villages and Sister Villages

Arni Surwanti, Tuti Purwaningsih

Abstract

People with disabilities are highly vulnerable during disasters due to socio-economic and physical factors. International and national policies, such as the United Nations Convention on the Rights of Persons with Disabilities and Law No. 8 of 2016 concerning Persons with Disabilities, emphasize the need to protect them during emergencies. Unfortunately, they are often overlooked in emergency preparedness systems, leading to a lack of awareness and knowledge about disasters. This study reviews existing disaster mitigation programs in disaster-prone villages and identifies the necessity for inclusive disaster mitigation. It focuses on volcanic disaster-prone areas, including those susceptible to hot clouds, lava flows, rock falls, incandescent rocks, and heavy ash rain. The research indicates the need for inclusive disaster preparedness indicators. The study recommends the following inclusive disaster mitigation indicators: establishing management information systems and disability data, strengthening village governments and disaster resilience teams, providing disaster information and knowledge to people with disabilities, creating standard evacuation and rescue procedures, advocating for accessible refugee camps, and allocating budget resources for disability protection. Additionally, the study highlights the importance of cooperation between sister villages in disaster-prone areas. Sister villages should be prepared to assist affected communities with refugee camps and evacuation processes. Inclusive disaster preparedness should encompass both disaster-prone and sister villages, integrating disability data, disaster information systems, government and resilience teams, disability education, evacuation procedures, and accessible refugee camps.

Parallel Session 2

14.30 - 15.45

Track 1 :
Hazard, Technology & Infrastructure

Room 1 (D-302) Group 1-C

Moderator :
Prof. Muksin Umar

Temporal Change and Spatial Distribution Analysis of b-value and a-value in Sumatra

Aulia Khalqillah, Muksin Umar

Abstract

The study of seismicity is very important to be conducted in the region of interest, such as Sumatra which has high seismicity. The seismicity can be learned by using a statistical approach through the b-value and a-value parameters. The b-value describes the stress accumulation of rock while the a-value describes the seismic activity. The objective of this research is to analyse the temporal change and spatial distribution seismicity based on b-value and a-value parameters in Sumatra by using an updated earthquake catalog from 1964 to 2022. This research found that in 1965 and 1972 have b-values greater than 2 temporally. In the spatial distribution analysis, Sumatra was dominated by b-value less than 1.91. Six clusters were found to have the lowest b-value. It might indicate high seismic stress accumulation spatially in these clusters. The temporal change and spatial distribution analysis were validated by using four destructive earthquakes in Sumatra, such as Sumatra-Andaman, Nias-Simeulue, Mentawai, and Pasaman Barat earthquakes. The b-values were found to be less than 1 either temporally or spatially. The largeearthquake was confirmed to have a low b-value. This indicates high seismic stress accumulation. These results could be used for further seismic hazard analysis and decision support for disaster mitigation purpose

Evaluation of The Performance of The Dualshpysics and Comcot Programs by Numerical Test to Simulate The Process of Tsunami Propagation and Overtopping in Seawalls

Ahmad Bagus Reza Zuliansah, Umboro Windujati, Teuku Muhammad Rasyif

Abstract

A tsunami is a destructive wave that can cause massive damage to coastal infrastructure. One of the disaster mitigation measures that can be chosen is the construction of coastal protection infrastructure,such as a seawall. Seawalls play a crucial role in protecting coastal areas as they can reduce wave energy and minimize the impact of tsunami-induced damage. However, during the 2011 Japan tsunami, the seawall built in Taro city failed as it proved to be less effective in handling the tsunami waves. The research conducted aims to model the propagation and overtopping of tsunami waves on the seawall, initially carried out through physical laboratory experiments, and later transformed into numerical test models using the Smoothed Particle Hydrodynamics (SPH) method and the Cornell Multigrid Coupled Tsunami (COMCOT) model. In this study, the parameters being compared include wave height, wave propagation, and overtopping on the seawall under two scenarios : the run-up of solitary waves on a shore without a seawall and the overtopping condition with a seawall using the Solitary Wave generation type, following the experiments conducted by Huang et al en 2022. Several parameters in the laboratory case study should be considered to expand our understanding of the systematically discussed tsunami propagation and overtopping processes and evaluate the capabilities of the SPH and COMCOT models.

Preliminary Study on The Duration of High-Frequency Ground Movement in Northern Taiwan from The Deep Regional Earthquake

Haekal A. Haridhi, Bor Shouh Huang, Muhammad Faizi, Putri Ramadhan, Ridrya A. A. Harahap, Nurhadi Ismanto, Dimas Sianipar

Abstract

The high-frequency seismic waves are usually generated by shallow earthquakes and is observed at a location near the earthquake source. Seismic energy tends to attenuate as it propagates through the Earth's surface and interior; however, this is not the case at the subduction zone. A regional earthquake that occurred within the subducting slab was observed to have high-frequency energy, although it is from the deep (i.e. > 100 km) and with moderate magnitude (i.e. Mw 5). This phenomenon resulted from the slab effect on focusing the earthquake signal or known as the guided wave. Taiwan has a complicated tectonic feature, where Taipei city, its capital, sits above the oblique subduction of Philippine Sea Plate (PSP), i.e. the southern Ryukyu subduction zone, enhancing its exposure to strong shaking resulting from the deep regional earthquakes. In this study, we use six regional earthquakes at the southern Ryukyu subduction zone recorded by the Formosa Array (FM Array). The FM Array is a dense seismic network with a total of 140 stations located in the northern part of Taiwan, with the distance between stations approximately 5 kilometers. With high-resolution data, we could identify the distribution of the guided wave phenomenon through body wave dispersion of deep regional earthquake signals, where only stations above 10 – 20 km from the plate interface showed dispersion. An Hp/Lp ratio with a 5-second moving window is applied to the dispersed signal. The results indicate that the high-frequency signal has a longer duration at stations that sit 10 to 20 km above the plate interface. This study suggests that the slab effect will produce an anomalous seismic intensity at the subduction region and should be considered in the Ground Motion Prediction Equation (GMPE) so that the damaged to buildings resulting from strong shaking could be reduced

Parallel Session 2

14.30 - 15.45

Track 1 :
Hazard, Technology & Infrastructure

Room 2 (D-303) Group 1-D

Moderator :
Dr. Ella Meilianda

Tsunami Scenario Triggered by The Activity of The Mentawai Fault Zone Offshore Western Sumatra Island

Haekal A. Haridhi, Saiful Mahdi, Cut Putrie Balqies, Chitra Octavina

Abstract

Subduction zones worldwide pose tsunami risks, mainly linked to megathrust activity near subduction trenches. However, tsunamis can originate from various sources, including marine volcanic eruptions, submarine landslides, and strike-slip earthquakes. In the Sumatra subduction zone, a seismic gap in the Mentawai region heightens the tsunami risk. This region's tectonics are complex due to the oblique subduction of the India-Australia oceanic plate beneath the Eurasian continental plate, leading to the sliver faults system of Mentawai Fault Zone (MFZ) and Sumatra Fault Zone (SFZ). The SFZ on Sumatra Island has limited tsunami potential, except at its northern and southern offshore extensions. Conversely, the MFZ, located in the marine Mentawai basin, has a higher tsunami-generation potential. Given this seismic gap, assessing MFZ activity is crucial. We used the COMCOT tsunami model to simulate scenarios with two fault mechanisms (strike-slip and back thrust) and three magnitudes (Mw 6.5, 7.6, and 8.2). Results show that the most hazardous tsunami, generated by a strike-slip fault with Mw 8.2, produces a 2-meter tsunami on the east coast of Siberut Island and the west coast of Padang City, West Sumatra. The scenarios reveal that Mentawai Island's eastern part lacks evacuation time, with an almost instantaneous tsunami arrival. In contrast, western Sumatra, including Pariaman and Padang City, has 13 to 20 minutes for evacuation planning. Thus, disaster risk reduction strategies in these locations should consider these findings.

Sustainable Livelihood Recovery for Earthquake-Tsunami Affected Communities in Loli Tasiburi and Loli Dondo, Donggala - Central Sulawesi

Nanda Annisa Husni, Arnice Ajawail, Agnes Meiria

Abstract

This study explores the implementation of the Rompong intervention as an alternative approach to support sustainable livelihood recovery for communities most at risk of being affected by the earthquake-tsunami in Loli Tasiburi and Loli Dondo, Donggala - Central Sulawesi, amidst the challenges posed by the COVID-19 pandemic. The research method was carried out using a qualitative study using a comprehensive methodology to assess the impact of the Rompong intervention on ecosystems and livelihoods in Loli Tasiburi and Loli Dondo. The findings of this research can serve as a valuable model for other communities facing similar challenges, providing insights into sustainable livelihood restoration and environmental restoration. The introduction of Rompong, a floating house installed in the sea to create a conducive environment for fish, emerged as a promising solution. The results of this study as a whole, the integration of the Rompong intervention represents a real and replicable solution to promote sustainable livelihoods and increase environmental resilience in areas affected by the earthquake and tsunami amid the COVID-19 pandemic. The use of rompong played an important role in rebuilding the community's economy after the disaster in Loli Tasiburi and Loli Dondo villages. This study highlights the importance of aligning development initiatives with the SDGs and emphasizes the need for psychosocial support to overcome the anxieties and concerns of people affected by natural conditions and the household economy. This intervention is in line with the principles of sustainable development and contributes to achieving the Sustainable Development Goals (SDGs), such as poverty alleviation, community resilience, climate change mitigation, and marine ecosystem preservation.

A New Multi-Purposes Flume Experiments Facility: Challenges and Opportunity for Tsunami Science and Engineering in Indonesia

Syamsidik, Benazir, Nadri Pratama, Arifullah, Eldina Fatimah, Nazaruddin4, Tarmizi5 Ibrahim, Ikramullah M Zein

Abstract

Physical modelling for tsunami engineering is rather difficult to conduct due to lack of comprehensive and advanced facilities to do so. Large number of simulations of the tsunami impacts were performed numerically. In early 2023, a new advanced tsunami flume facility has been completed at Tsunami and Disaster Mitigation Research Center (TDMRC) of Universitas Syiah Kuala. This flume has 60 m in length, 2.5 m in width, and 1.7 m in height. The flume is also equipped with a number of wave, pressure, and current sensors, Particle Image Velocimetery (PIV) Camera, and a laser bed profiler. Beside of the tsunami generator, this flume is also capable to generate wind-driven waves (with two large wind turbines), regular and irregular waves, and currents. The flume provides new opportunities as well as challenges for tsunami scientists and engineers in Indonesia to collaborate and to perform novel researches in tsunami mitigation. This article is aimed at elucidating technical challenges and opportunities in performing tsunami physical models with the large tsunami flume. we performed a series numerical models using DualSPHysic. The results show that composite beach slopes inside the flume has succesfully mimic shallow coast effects that later deformed the incoming tsunami waves into breaking, bores, and runup. Challenges were identified in absorbing tsunami waves with more than one incoming wave to the observation area. In the future, this facility will be accessible for scientists and engineers to collaborate in tsunami science and engineering researches.

Keywords: Tsunami; flume; experiments; DualSPHysic; pressure tank; runup.

Enhancing Tsunami Resilience: Investigating the Effectiveness of Coastal Vegetation through Numerical Modeling and Assessment in Indonesia

Benazir, Radianta Triatmadja, Nizam, Syamsidik, Warniyati .

Abstract

This research endeavors to investigate the effectiveness of various coastal vegetation species commonly planted in Indonesia for mitigating the impact of tsunamis. Given the significant threat tsunamis pose to coastal communities, the development of effective mitigation strategies is of paramount importance. In this study, we assess the performance of coastal vegetation through a comprehensive evaluation of its physical characteristics and employ numerical modeling utilizing the Smoothed Particle Hydrodynamics (SPH) method by DualSPHysics software. The research methodology comprises two primary components. Firstly, a rigorous assessment of coastal vegetation is conducted to identify species that exhibit desirable characteristics for tsunami mitigation. Parameters such as root system characteristics, stem density, leaf morphology, and canopy structure are thoroughly evaluated to determine the vegetation's ability to dissipate wave energy and reduce wave height. Additionally, the assessment encompasses considerations of adaptability to local environmental conditions and resilience against tsunamis. Secondly, a numerical model is developed using the SPH method with the DualSPHysics software to simulate the interaction between tsunamis and coastal vegetation. This modeling approach enables the investigation of wave propagation, energy dissipation, and flow dynamics in the presence of different coastal vegetation configurations. By simulating various species of coastal vegetation commonly found in Indonesia, the study aims to quantify the reduction in wave energy and attenuation of wave height provided by these vegetation types. The results of this research will yield valuable insights into the effectiveness of different coastal vegetation species in mitigating the impact of tsunamis in Indonesia. These findings will contribute to the development of optimized planting strategies and robust coastal management plans to enhance the resilience of coastal communities against tsunamis. Furthermore, the utilization of the DualSPHysics numerical modeling approach will facilitate the exploration of future scenarios and the evaluation of additional coastal vegetation species, fostering the development of sustainable and effective tsunami mitigation strategies on a global scale. Keywords: Tsunami hazard, mitigation, vegetated area, mathematical modeling, field inventory"

Parallel Session 2

14.30 - 15.45

Track 1 :
Hazard, Technology & Infrastructure

Room 3 (D-304) Group

Moderator :
Dr. Aaron Opdyke (Online)

The Lesson Learnt from Mentawai Tsunami, October 25th 2010

Herdiana Mutmainah, Woro Dominika Christiana, Aprizon Putra, Rizki Anggoro Adi

Abstract

The Mentawai Tsunami, October 25th, 2010 was caused by collision between the Indian-Australian plate with the Eurasian plate that caused the fault in the Sunda subduction zone megathrust. Tsunami with magnitude 7.7 MW occurred at 21:42:22 pm which epicenter at 3.484oSL and 100.114oEL, 20.6 km depth in the Indian Ocean, 110 km from the North Pagai. Tsunami Mentawai, 2010 is started by an underwater earthquake and called as slow tsunami because the ground shaking is quite weak in long periods but produce great waves. Tsunami simulation was performed using COMCOT 1.7 with cesarean parameter strike 325o, dip 11.62o and slip 101.4625o. This research aims to know the lesson learn from The Mentawai Tsunami from some aspects i.e tsunami risk inundation area and the impact to the coastal ecosystem. The simulation shows the run up is ranged from 3.4 to 4.3 meters with the first arrival time is 9 min 33 sec. Most of the west coast of The North Pagai Island are categorized as moderate to high risk inundation area and the impact is coastal degradation i.e lost of small island, abration, mangrove degradation and coral bleaching.

Keywords: Mentawai Tsunami; tsunami impact; COMCOT 1.7

Uncovering Patterns of Risk Creation in Settlement Planning and Design to Inform Resilient Adaptation

Strategies Grace Muir, Aaron Opdyke

Abstract

Indonesia is a highly hazard-prone country and despite efforts to reduce disaster risks, losses and damages are high. Over 650,000 houses have been damaged by various hazard events in the last five years alone. Observed losses here suggest processes of risk creation could be routinely undermining efforts to reduce risk, providing an important context for research assessing patterns in disaster risk creation. This study focuses on processes related to settlement design (structural conditions) and location (land-use planning). In the context of infrastructure disaster risk, an array of actors influence the risk landscape, including engineers, local authorities, organisations, and community members. This early-stage research lays out a proposed analysis of infrastructure-related risk conditions in six communities in Indonesia. A subsequent aim will be to assess how modelling potential disaster scenarios and associated settlement-related needs could generate meaningful discussions around identified risk conditions. This research sets out to address the following objectives: (1) Identify engineering, organisational, and social conditions influencing risk; (2) Assess the potential for risk-informed settlement planning and design; (3) Investigate how anticipating disaster scenarios could facilitate collaborative settlement planning and design processes. The six communities will be sampled through an approach which seeks to exemplify variations in infrastructure risk landscapes. Qualitative data will be obtained for objective one via semi-structured interviews and focus group discussions. Participants will represent the spectrum of engineering, organisational, and social systems influencing the risk landscape in each community. To address the second objective, insights from multi-hazard models, community-based risk knowledge, and expert consultation will triangulate risk information across community-scale settlements. Local participants will be included in risk mapping and validation workshops. The final objective will be achieved by conceptually reconstructing risk landscapes to investigate how disaster scenarios could be utilised as an anticipatory risk management approach. The design of these scenarios will utilise the outputs of the first two objectives of this study (community risk conditions and infrastructure risk maps). Following the creation of scenarios, focus group discussions will be conducted to assess how practitioners and communities could work with anticipated settlement-related needs, showing how this form of risk knowledge could be integrated into future settlement design and planning activities. Assessments of risk will be inclusive of the values and knowledge of at-risk communities across all objectives, since working with participatory approaches should help mitigate the promotion of maladaptive practices. This study's outputs – making location-specific risk creation processes explicit – could enable local-level policymakers, planners, engineers, and community members to adopt risk-informed approaches in settlement planning and design. This early-stage research will contribute a new framework for interrogating risk creation processes which are often overshadowed by the dominant risk reduction lens.

Probabilistic Analysis of the Tsunami Disaster on the Vulnerability Level of Buildings in Painan City, West Sumatra based on the Earthquake Ratio with the Logic Tree Method

Happy King Princes Sitinjak, Agiel Malik Ibrahim, Gusti Mahendra Putra, Teuku Muhammad Rasyif

Abstract

Indonesia is an archipelagic country stretching from Sabang to Merauke and is located at the convergence of the most complex and active tectonic plates in the world, namely Eurasia, Indo-Australia, and the Pacific. One of the regions with a high probability of earthquakes and high tsunamis is the island of Sumatra, which lies between the Eurasian and Indo-Australian plates. Painan city is located in West Sumatra Province, where it is surrounded by three megathrust zones: the Nias-Simeulue segment, Mentawai-Siberut segment, and Mentawai-Pagai segment. These three megathrust zones, namely Nias-Simeulue with an estimated earthquake magnitude of 8.7 Mw, Mentawai-Siberut with an earthquake magnitude of 8.9 Mw, and Mentawai-Pagai with an earthquake magnitude of 8.9 Mw, can potentially cause tsunamis that may reach Painan city. The aim of this study is to investigate the influence of seismic activity level variables and the ratio between large and small earthquakes on tsunami wave height using the logic tree method, assess the tsunami hazard potential using Probabilistic Tsunami Hazard Assessment (PTHA), and evaluate thevulnerability of existing buildings in Painan city. Tsunami simulations in this study were conducted using the Cornell Multigrid Coupled Tsunami (COMCOT) program, which applies the Shallow Water Equation (SWE). Additionally, the Building Tsunami Vulnerability (BTV) equation was used to calculate the vulnerability index of buildings based on their conditions and tsunami wave heights. The calculation of the BTV value for the tsunami height parameter was modified using fragility curves that depict the relationship between force and the probability of tsunami wave damage. From the simulation results, the tsunami height was obtained, which in turn determines the probability of tsunami hazard on buildings with return periods of 1000 and 4000 years. After the simulations, the Building Tsunami Vulnerability (BTV) calculation was performed to determine the vulnerability level of buildings to tsunamis. Keywords: Probabilistic Tsunami Hazard Assessment, Building Tsunami Vulnerability, Logic Tree, Cornell Multigrid Coupled Tsunami, Painan City

Imaging Of Hydrodynamic Field Around Submerged Objects under Tsunami Waves Conditions

Arifullah Arifullah, Nadri Pratama, Ikramullah Zein, Nazaruddin, Tarmizi, Ibrahim

Abstract

Hydrodynamic particle movement under regular waves are rarely studied due to its complicated sensors. This research is aimed at investigating flow fields around submerged structures due to regular waves. A series of experiments were performed at Tsunami Flume Workshop Facility at Tsunami and Disaster Mitigation Research Center (TDMRC) of Universitas Syiah Kuala. The flume has 60 m in length, 2.5 m in width and 1.7 m in height. To model the regular waves, a set of electrical paddle and sensors were placed at one end of the flume. This set of equipment is able to mimic any waveform model, in this case a regular wave with three scenarios. A submerged structure was placed on the bed of the flume to model underwater structures. To capture the flow fields, we use a Laser Particle Image Velocimetry (PIV) Camera made in Seika. During the experiments, the results show different eddies patterns were generated in front of the submerged structures. Longer and larger eddies and the velocity were identified around the front of the structures. This could be interpreted as more chaotic hydrodynamic fields around the submerged structures under wave-like conditions."

Parallel Session 2

14.30 - 15.45

Track 2 :
Inclusive Community Resilience and Disaster Education

Room 4 (D-402) Group 2-D

Moderator :
Dr. Elizabeth Maly

Building Women-Led Community-Based Protection at the Village Level in Improving Community Resilience in Post Disaster: A Case Study of Humanitarian Action and Resilience Program in 5 Districts

Riza Imaduddin Abdali, Richa Syapitri

Abstract

This paper elaborates on efforts to build Women-Led Community-Based Protection (WLCBP) at the village level in humanitarian action. These efforts are closely related to promoting localization and community resilience in the context of disasters by placing them on three essential elements: building individual and collective power, transforming existing systems and structures, and access to rights, services and resources. This paper is based on learning and analysis of the Humanitarian and Resilience Action Program conducted by YAPPIKA-ActionAid in five districts, namely Sigi, Donggala, Mamuju, Pandeglang, and Serang regency from late 2019 to mid-2023. From these lessons, community-based protection led by women has two main strategies. First, build a women-friendly space at the village level. There are seven functions of this women's friendly space, namely providing tools for women's daily needs during disaster response, an information centre on essential services and disasters, providing psychosocial support activities during disaster response, a meeting place to increase the capacity and empowerment of women's communities, a friendly space for women to have open discussions, manage cases of gender-based violence and referral channels at the village level, and provide counseling services for survivors of gender-based violence. Secondly, designing and implementing community protection actions. This form of community protection action includes identifying individuals, families and groups who are most vulnerable in accessing assistance during disaster response; ensuring that there are female facilitators who are trained on issues of protection, livelihood, and disaster risk reduction; mobilising communities to plan and implement community-based protection actions at the village level; mapping the community to identify vulnerable groups in order to obtain disaggregated data on accessing basic services; develop preparedness plans to ensure inclusive, safe and protected access for vulnerable groups in an integrated manner in all disaster response actions; build awareness of gender-based violence and identification of protection issues through public campaigns; to evidence-based advocacy on protection issues for communities. The assumption built in this paper is that these two main strategies can run optimally if there are four pillars, namely 1) a female focal point which is able to understand the characters and issues that exist in her area and the capacity to build strong coordination with stakeholders; 2) involving men in protecting women and children, starting from raising awareness through a series of meetings to meaningfully involving men in community protection actions; 3) evidence-based solid advocacy by women's communities and local civil society organizations on protection issues; and 4) strong support from village level actors on the issue of protecting women and children in a disaster context in the form of commitment statements, village level regulations, to village budget allocations. In turn, efforts to build women-led community-based protection will have transformative changes in overcoming inequality, violence and discrimination against women that have lasted for a long time to achieve women's human rights regarding safety, security and dignity.

Disaster Picture Books in Japan and the United States: An Inventory and International Comparison

Elizabeth Maly, Ryo Saito, Julia Gerster

Abstract

Stories related to disasters appear in picture books for children around the world, in many languages. With a long history of repeated disaster experience as well as established traditions of disaster storytelling and disaster risk reduction education, Japanese picture books about disasters have existed for many years. However, similar to the expansion of various other methods and media applied to disaster memorialization and education, there was also an increase in the number disaster picture books published after the 2011 Great East Japan Earthquake. With narratives shaped by the Japanese context of what kind of information should be presented to or shared with children, disaster picture books tell a variety of stories about disaster experiences. However, with many books written after the 2011 tsunami, and in a country with many earthquakes, Japanese disaster picture books often feature earthquake or tsunami events. Perhaps primarily shaped by different disaster exposure and experience, disaster picture books in the United States also tell the stories of storms, floods, fires, and/or evacuation/rebuilding. Reflecting different cultural norms, U.S. picture books have a stronger emphasis on helping children understand what may be/is happening to them, such as evacuation, the devastation or rebuilding of a community, along with explanations of the hazard events. With little academic literature on this topic, this initial research starts with an investigation and inventory of disaster picture books in Japan (in Japanese), and in the United States (in English), with plans to expand to include other counties and eventual languages. After of typological categorization of disaster picture books by type of message, approach, hazard, and disaster phases, it is expected that comparative text analysis of disaster pictures books from the two countries will lead to clarification of key differences between Japan and the United States, and insights into the differing methods and approaches towards disaster education through picture books. This research is also intended as the basis to develop further practical applications and the creation of new picture books in multiple languages.

Inclusive Disaster Risk Reduction Education for Children with Special Educational Needs and Disabilities in Aceh, Indonesia

Munadira

Abstract

When natural catastrophes strike, children with special educational needs and disabilities (SEND) are far more likely to die or be injured than their classmates. To assist improve this condition, international regulations demand for inclusive disaster risk reduction education (DRRE). Children with SEND were generally absent from published research, the DRRE programs, and all subsequent reviews of the DRRE programs, according to prior study results.This research concentrates on Indonesia, particularly Aceh, which has one of the highest rates of natural catastrophes, including tsunami. In order to improve disaster resilience in Aceh tsunami risk region, this study intends to assess the existing state of the school community collaboration network for kids with special needs and disabilities and its contributing variables. This study explores the preparedness of children with disabilities dealing with earthquakes and tsunami and other natural hazards. In order to examine the state of the school-community partnership at the moment, we examined the results of a research conducted in Aceh's coastal regions. To examine the state of the school-community partnership for children with special needs, we examined the results of a research conducted in coastal Banda Aceh and Aceh Besar. A case study technique was used to carry out the investigation. A-depth interviews with teachers and parents, Focus Group Discussions (FGDs) at schools, questionnaire surveys of teachers and school principals, and a workshop with 30 participants from schools, school committees, community leaders, and NGOs were all used in the data collection process. Data analysis was obtained through thematic analysis with NVivo 13. The procedures taken to identify the network's stakeholders, the degree to which those parties are able to operate together, and the opportunities and difficulties that schools, particularly those serving students with disabilities and special needs, encounter when trying to form partnerships. This research shows how a school-community collaborative network may benefit all of the network's members while also acting as an active and necessary support for the school. Factors that contributed to resilience school-community collaborative network in enhancing safety school for children with special educational needs and disabilities were also identified.
Keywords: disaster risk reduction, children with special educational needs and disabilities, case study

The Effect of Parkour for Disaster Preparedness Training on Psychological Preparedness for Disasters in Indonesia

Handy Aulia Zharfani, and Bhina Patria

Abstract

This research was conducted using a quasi-experimental method involving 24 participants aged 15-18 years who were assigned to the experimental group (n=11) and the control group (n=13). The experimental group were given general knowledge training on disasters (180 minutes) and parkour training for disaster preparedness (3 x 120 minutes), while the control group were only given general knowledge training. Measurements were made using the Psychological Preparedness for Disaster Threat Scale. The study results show a significant difference in scores before and after being given general knowledge training in the experimental group (p=0.024) and the control group (p=0.012). However, there was no difference in scores in the experimental group after being given the parkour training (p=0.983), and there was no significant decline in scores in the control group that was not given any treatment (p=0.297). The final results showed no significant score difference between both groups (p=0.236). Therefore, this study concludes that general knowledge training on disasters effectively increases psychological preparedness for disasters, while the parkour for disaster preparedness training does not affect psychological preparedness for disasters because the parkour training provided was insufficient to fully develop the flight response skills for disasters.

Parallel Session 2

14.30 - 15.45

Track 2 :
Inclusive Community Resilience and Disaster Education

Room 5 (D-403) Group 2-E

Moderator :
Dr. Rizanna Rosemary

The Role of Religious Place of Worship in Effective and Inclusive DRR

Yonathan Denny Subrata Tarigan

Abstract

Places of worship play a crucial role in Disaster Risk Reduction (DRR) within BNPB's seven resilience objects concept. These places, like churches, face risks and potential losses due to disasters and must contribute positively to enhancing community resilience in disaster-prone areas. Disaster-resilient churches serve as hubs for religious-based disaster education and literacy, promoting community resilience before, during, and after disasters. To create a disaster-resilient church, both internal and external components must be strengthened. Internally, congregational leaders should promote ecological awareness through sermons, Bible studies, and community services. This ecological conversion encourages proactive environmental care based on religious teachings and Indonesia's disaster history. Religious leaders, as messengers, can inspire their followers to take real actions in DRR activities. Additionally, the church should assess its threats, vulnerabilities, and capacities, allocate funds for disaster preparedness, conduct simulations, establish evacuation plans, enhance volunteer training, and audit infrastructure accessibility, especially during church activities. Externally, the Ambarrukma Javanese Christian Church fulfills its PRB role through the Disaster Management and Community Services Unit (Unit PB PALMA). This extension of the church provides vital services, including vulnerability and capacity threat analysis, pre-disaster training, emergency response, and community rehabilitation and reconstruction efforts. Collaboration between churches and communities along the Gajah Wong River includes information exchange and discussions to address flood, earthquake, and strong wind risks. Local wisdom-based DRR innovations respond to community needs and have led to various joint activities, including emergency response simulations, river cleaning, early warning systems, and disaster preparedness support. Qualitative research, involving visits, interviews, and focused discussions with pastors, the PB PALMA GKJ Ambarrukma Unit, congregations, and community members along the Gajah Wong River, evaluates the effectiveness of DRR activities. Places of worship, driven by their duty to serve and care for the Earth, play a significant role in disaster response. If religious leaders and places of worship actively advocate DRR through sermons, campaigns, and actions, it would strengthen DRR mainstreaming, benefiting disaster-affected communities. Keywords: Resilient places of worship, disaster risk reduction, effectiveness, inclusivity.

ECOPARTI: Inclusive & Integrative Organic Waste Management as A Social Intervention

Zafira Amani

Abstract

The piling up of waste at the Piyungan Integrated Waste Treatment Facility is no longer a secret. The abundance of waste at the facility poses several potential disasters. One of them is the explosion of methane gas caused by decomposing organic waste. Therefore, concrete efforts are needed to reduce and stop the supply of organic waste to the facility. There have been various community initiatives to address this issue. However, these solutions have not been implemented on a massive and inclusive scale. Certainly, this is a good starting point for changing waste management behavior in society. However, greater efforts are needed to create behavior that is sustainable. Behavioral change stems from thinking, and to change thinking on a mass scale, the most effective thing to do is to cultivate ideology. Ideology is an abstract concept, so a medium is needed to instill it. A medium that can be used is a social movement that produces something concrete and inclusive. It is a platform where everyone can participate, both in action and voice. The campus is the right place to cultivate an ideology and initiate a social movement. The existence of a community engaged in eco-enzyme production with a rewang system, involving women economic actors, campus facilities, and students, can serve as a medium for educating the ideology of environmentalism in society. This movement is a tangible starting point that environmentalism is not an exclusive utopian imagination, and people will be encouraged to take action to change their behavior to be more environmentally friendly. Keywords: organic waste, ideology, inclusivity, community.

Climate Change Disaster Mitigation Through an Eco-Friendly School Development Model at SMA 3 Annuqayah Sumenep

Herlina

Abstract

Climate change has serious implications for human life, including rising temperatures, ozone layer depletion, and environmental crises. Human activities like pollution and waste exacerbate these issues, resulting in biodiversity loss, water pollution, disease outbreaks, and extreme weather events. SMA 3 Annuqayah, part of Pesantren Annuqayah, is tackling these challenges by building the "Pemulung Sampah Gaul" (Cool Garbage Collectors) community. Through reforestation, waste management, and various environmental activities, students are developing eco-conscious leadership. This study explores how SMA 3 Annuqayah's eco-friendly program and the "Pemulung Sampah Gaul" community mitigate climate disasters through their environmental education curriculum. Data is collected through observation, interviews, and documentation, ensuring credibility through triangulation. This research is crucial for uncovering climate disaster mitigation models, like reducing plastic waste and creating plastic-free schools. The PSG team, comprising SMA 3 Annuqayah students, collaborates to raise environmental awareness and leadership, emphasizing Earth preservation and local wisdom. These findings emphasize the importance of humans and nature working together and offer insights for future knowledge, creativity, character development, and environmental stewardship.

Inclusive Website of Disaster Risk Reduction Forum as a Medium to Increase Community Resilience and Disaster Education in Gunungkidul Regency, Yogyakarta

Amin Nurohmah, Siti Irene Astuti Dwiningrum, Suwarjo, Nainta Agustanta, Faizal Aco, Sutari, Asih Purbowati

Abstract

Gunungkidul Regency has an area of 1,485.36 km2 or about 46.63% of the area Special Region of Yogyakarta Province with a high disaster risk index. The number of people with disabilities in Gunungkidul Regency reaches 6,019 people. The high number of disabilities in Gunungkidul Regency and the restrictions on activities during the Covid-19 Pandemic which had an impact on the lack of direct socialisation related to disaster mitigation, became the basis for the Disaster Risk Reduction Forum (FPRB) of Gunungkidul Regency to be involved in the IDEAKSI (Idea Innovation Action Inclusion) program to develop an inclusive digital website for disaster mitigation and disaster risk reduction. This development research is part of the implementation of the IDEAKSI programme. The method used is research and development with reference to the Borg & Gall model. The research was conducted in Gunungkidul Regency, Yogyakarta with the aim of developing disaster risk reduction media in the form of a Disaster Risk Reduction Forum Inclusive Website as an effort to increase community resilience and disaster education, especially for vulnerable groups in Gunungkidul Regency. The development research lasted for 3 months (October-December 2021) involving the Disaster Risk Reduction Forum (FPRB), Disability Resilience Forum (FDTB), Communication and Information Office, Disaster Management Agency, and Disability Empowerment Organisation in Gunungkidul Regency. The website development uses an inclusion approach based on the results of focus group discussion. The results showed that: (1) Gunungkidul Regency has a policy in the form of Regional Regulation Number 9 of 2016 concerning the Implementation of Protection and Fulfilment of the Rights of Persons with Disabilities, but disaster risk reduction efforts have not fully involved vulnerable groups including disabilities. (2) FPRB of Gunungkidul Regency Inclusive Website is based on the principle of inclusion according to the A11y checklist related to Keyboard Navigation, and the Universal checklist includes (visual elements, semantics, animation, text content, flexibility, specific page titles, and each page is set with the appropriate language). The development process is in collaboration with the Communication and Informatics Office of Gunungkidul Regency by using a regional server to maintain the security of user data (3) The website menu includes four things, (disaster risk reduction menu, accessibility survey menu, creative economy menu, and disaster risk reduction activity news menu). Until now, the use of the website has been going well. In the future, FPRB of Gunungkidul Regency nclusive Website still needs development support, especially related toSearch Engine Optimisation (SEO), synchronising the website with the Village Information System (SID) to improve the follow-up of accessibility survey results, and socialitation the use of the website at the regional level so as to support more inclusive development. Keywords: Inclusive Website, Disaster Risk Reduction, Resilience.

Day 2

12 October 2023

Parallel Session 3

10.30 - 11.45

Track 1 :
Hazard, Technology & Infrastructure

Room 1 (D-302) Group 1-F

Moderator :
Prof. Syamsidik

Insights into the Impact of Tsunamis on Buildings in Array Layouts and Macro Roughness through Comprehensive Mathematical Modeling

Radianta Triatmadja, Benazir, Kuswandi

Abstract

The coastal regions are undergoing rapid urbanization and development, resulting in increased population density and the concentration of infrastructure along shorelines. However, these areas are highly susceptible to the devastating impact of tsunamis, which arise from underwater earthquakes and other geological events. Despite the historical occurrences of tsunamis and the awareness of their destructive potential, post-disaster rehabilitation and reconstruction efforts often prioritize rebuilding in the same locations without substantial relocation away from the coastline. This study aims to comprehensively investigate the effects of tsunamis on buildings with an array layout, with a specific focus on the intricate variations in macro roughness. Employing a comprehensive approach, this research utilizes mathematical modeling techniques, specifically employing the DualSphysics model, to analyze the interaction between tsunamis and structures. The DualSphysics model is renowned for its high accuracy in simulating complex fluid dynamics, making it an appropriate tool for investigating tsunami behavior. Through the application of this model, the study aims to gain valuable insights into the performance and resilience of buildings subjected to tsunami forces in array layouts characterized by macro roughness. The research seeks to provide a deeper understanding of how buildings respond to tsunamis, considering the unique challenges posed by array layouts and macro roughness. It aims to elucidate the dynamic loads, hydrodynamic forces, and structural responses induced by tsunamis, with a particular emphasis on the intricate interactions between waves and buildings. This knowledge is essential for developing effective strategies to mitigate tsunami risks in coastal regions and improving the design and construction practices for buildings in areas prone to tsunamis. By combining mathematical modeling with the specialized capabilities of the DualSphysics model, this study aims to offer valuable insights into the behavior of buildings exposed to tsunamis in array layouts. The findings have the potential to contribute to the development of resilient coastal infrastructure, facilitate informed decision-making during post-disaster recovery, and guide the implementation of appropriate mitigation measures. Ultimately, the research seeks to enhance the safety and resilience of coastal communities facing the constant threat of tsunamis, ensuring a more sustainable and secure future for these vulnerable regions.
Keywords: Coastal regions, rapid urbanization, development, mitigation, decision-making

Characteristics of landslides induced by an earthquake from a hidden strike-slip active fault in the Cianjur Area of West Java

Iwan Gunawan Tejakusuma, Firman Prawiradisastra, Khori Sugianti, Adrin Tohari, Zufialdi Zakaria, Syakira Trisnafiah, Riski Fitriani, Dimas Biwas Putra, Antonina Pri Martireni1 and Bayu Budiman.

Abstract

On November 21, 2022, the Cianjur area in West Java, Indonesia, experienced devastating landslides caused by a magnitude 5.6 earthquake, with the epicenter traced on a hidden active fault approximately 11 kilometers beneath the surface known as the Cugenang Fault. This study investigates the post-disaster landslide and aims to discover the characteristics of the landslides triggered by this earthquake. The methodology covers literature study, descriptions of lithology, estimation of landslide slip surfaces, soil weathering and thickness, slope, land cover and land use changes, landslide orientation, and its distance to the earthquake epicenter and the Cugenang active fault. Unmanned Aerial Vehicle was used to support landslide analyses from a spatial perspective. The study showed a close relationship between the more significant shaking along the active fault with the occurrences of the Cijedil, Cugenang, Sarampad, and Rawacina landslides. These landslides are between 0.35 to 0.67 kilometers from the fault. All landslide directions are southwestward, indicating dominant lithological control for the landslides. The impermeable tuff layer is estimated to act as the sliding plane. The bedding layer plays a vital role in landslide incidents where the residual soil and the highly weathered breccia and tuff volcanic deposits lie in a similar direction to the slope, causing a vulnerable setting to landslide.Sarampad and Rawacina landslides morphology and exposures showed similar phenomena to liquefaction. To a certain degree, land use change, including slope cutting without proper slope stabilization measures, contributes to landslides.

Promoting Safe School Design by Determining the seismic performance of existing school buildings in Indonesia (Lesson learned from several major earthquakes)

Yunita Idris, Cut Nella Asyifa, Adrian Ulza, Zahra Amalia, Yulia Hayati

Abstract

Several major earthquake events that have occurred in recent years, such as the Pidie Jaya earthquake with a magnitude of 6.5 Mw (December 7, 2016), Lombok earthquake with a magnitude of 7.0 Mw (July 2018), Central Sulawesi earthquake with a magnitude of 7.4 (September 28, 2018), and the recent Cianjur earthquake with a magnitude of 5.6 (November 21, 2022), indicate a high level of damage to school buildings due to earthquakes. These damages have disrupted teaching and learning activities and compromised the structural integrity of school buildings. According to seismic design regulations (SNI:1726-19:2019), school buildings, being educational facilities, are categorized as having the highest priority factor, equivalent to healthcare facilities. This study aims to identify the level and patterns of damage that occur in school buildings, particularly those constructed with masonry walls, where the walls are the primary load-bearing elements. This type of construction is believed to be able to withstand earthquakes in some studies due to its rigidity and typically being single-story buildings. The methodology used in this study involves collecting field data from surveys conducted by the team on buildings damaged after the Pidie Jaya earthquake (2016), Central Sulawesi earthquake (2018), and Cianjur earthquake (2022). School buildings in Indonesia are regulated by standards issued by the Ministry of Education and Culture (2019), and earthquake loads are governed by SNI 1726-2012 initially, and the latest version is SNI 1726-2019. Differences in location will slightly affect the building design and materials used. Therefore, this study compares several variables of building capacity in resisting earthquakes, such as the influence of seismic mechanisms, local design factors, and materials. The results show that local wisdom also influences architectural design, which affects the loadings. The selection of local materials also influences the structural resilience of buildings. The appropriate design of the confined masonry structures is need to adjust with local materials and local technologies for each location in Indonesia.

Keywords: confined masonry, earthquake, safe schools, building

Parallel Session 3

10.30 - 11.45

Track 1 :
Hazard, Technology & Infrastructure

Room 2 (D-303) Group 1-G

Moderator :
Dr. Erick Mas (Online)

Benchmarking The Use Of Shaking Tables For Simulating The Earthquake Performance Of Typical Residential Houses For Disaster Risk Reduction

Yulia Hayati, Cut Nella Asyifa, Yunita Idris, Adrian Ulza

Abstract

This study presents a comprehensive review focused on the role of earthquake shaking table simulation for understanding the potensial risk of confined masonry structures of residential houses. Understanding the potential risk is lead to mitigating earthquake hazard risk of the typical confined masonry structures of residential houses. The primary objective of this study is to assess the effectiveness of earthquake shaking table simulations in evaluating and mitigating earthquake hazard risk for confined masonry structures, particularly for the typical residential houses in in the most rural areas in Indonesia. Byexploring the existing research and case studies, this research seeks to identify key factors influencing the performance and resilience of confined masonry structures during seismic events. Thorough literature reviews on different research papers on the earthquake simulation test on the confined masonry will be carried out. The reviews include the loading models, type of the construction models, and boundaries of the simulations. This understanding will facilitate the identification of potential areas for improving designs, constructions, and retrofitting practices, that specifically targeted at enhancing seismic resilience in lowincome communities. The outcomes will facilitate evidence-based decision-making, leading to improved seismic resilience and safer residential buildings in these developing areas where confined masonry houses are more needed and more vulnerable. Finally, the work of this study can greatly assist in preparing the most appropriate specimen model of masonry structures, which are intended to undergo testing in the earthquake shaking table facility at the Tsunami and Disaster Mitigation Research Center (TDMRC) of Syiah KualaUniversity (USK). Keywords: confined masonry, earthquake, shaking table, vulnerability, residential houses.

Flood simulation to determine flood hazard susceptibility of downstream Singkil watershed in Aceh Province

Dedy Alfian, Ella Meilianda, Ashfa, Muhammad Syukri

Abstract

The damage to the Singkil watershed, one of the largest watersheds in Aceh Province, has become a concern for many parties, primarily due to increased flood events in the downstream area of the watershed. Based on previous studies, the problems which cause flooding are watershed damage due to illegal logging and high rainfall intensity reaching 3000-4500 mm/year, and increased erosion of 0.887 tons/ha/year, which causes a decrease in river capacity due to sedimentation. For this reason, this study aims to do 2D flood hydraulic modeling for five return periods of 2, 5, 10, 25, and 50 years which can be a reference for flood management in Aceh Singkil District. The hydrological analysis of the design flood discharge for several return period was carried out using Nakayasu and SCS-CN method. 1D-2D flood simulation generated using GeoHECRAS software to study flood hazard characteristic at downstream by combining tidal effects. The flood event in September 2012, a 10-year return period flood, became the basis for validating and calibrating the simulation model. Based on flood simulation result, it is known the downstream area of the Singkil watershed, Aceh Singkil districts is an area with a high flood potential and frequently occurs.

Forecasting spatial population distribution in tsunami hazard zones using mobile data

Erick Mas, Shunichi Koshimura

Abstract

In the context of developing a Coastal Digital Twin for Japan, accurate real-time population exposure estimation is essential for effective disaster preparedness and response. This study investigates the application of mobile spatial statistical data to forecast spatial population distribution and their exposition to tsunami hazards. Using this approach, we can account for the variations in population dynamics that affect the levels of response and assistance required in different scenarios. Our findings demonstrate significant variations in the expected number of people at risk of tsunami during a year, highlighting the importance of incorporating real-time data into forecasting models. However, using mobile data for population exposure estimation also poses challenges. We discuss the implications of our findings for disaster management and suggest future research directions to improve the accuracy and effectiveness of population exposure forecasting from mobile data.

Analyzing Google Trends for Scoping the Enhancement Needs of Hydrometeorological Early Warning Services in Indonesia

Ainur Ridho, Dewa Putu Adikarna Mandala, Mizan B. F. Bisri

Abstract

This study investigates the state of public interest in hydrometeorological services in Indonesia through internet-based platforms, such as weather and climate forecasts and early warning systems. The research utilizes Google Trends data to assess public search behavior during selected disaster events, including The 2020 Jakarta Flood, The 2021 TS Seroja, and The 2022 Semarang Coastal Flood, to evaluate the timeliness and relevance of existing early warning systems. The results highlight an increasing interest in weather-related information, with specific demands for advanced weather predictions and localized forecasts in provinces with significant agricultural production. However, flood hazards received higher search volumes due to their immediate impact. The study reveals shortcomings in timely warning dissemination and the quality and relevance of information provided in the existing warning products. Across case studies, the paper demonstrates that the timeliness of official warning products is getting better in meeting the public need for information. However, there are gaps in terms of quality information and essential data provided in the warning products for both floods and storms/cyclones. To improve the integration of public perception into risk communication, the study recommends providing localized and sector-specific predictions, addressing knowledge gaps, and enhancing communication and coordination between official organizations and the public. These measures will contribute to better community resilience and disaster response.

Parallel Session 3

10.30 - 11.45

Track 1 :
Hazard, Technology & Infrastructure

Room 3 (D-304) Group 1-H

Moderator :
Mr. Sesa Wiguna

Building damage classification using remote sensing and domain adaptation approach for rapid assessment

Sesa Wiguna, Bruno Adriano, Erick Mas, Shunichi Koshimura

Abstract

Building damage detection is a priority in rapid disaster assessment as it serves significant roles in both emergency and recovery planning efforts. To solve accessibility issues and manual work, deep learning (DL) and earth observation technologies (EO) have been widely integrated to develop automated building damage recognition tools. Recent development shows that DL-based models are getting more and more reliable in terms of accuracy and efficiency. However, many DL-based models are designed for a specific location making the models yield satisfactory results in in-domain (IND) testing yet less accurate in predicting the damage of different locations (out-of-domain or OOD). This makes the practical use of DL and EO models are limited in supporting rapid disaster efforts since the real-world application tends to follow OOD settings rather than IND. In this study, instead of directly using trained models to predict damage in new locations, we aim to improve the model generalization in OOD settings by implementing domain adaptation (DA)-based techniques. We use global historical datasets and state-of-the-art-of DL-based models to illustrate the usefulness of the techniques for disaster emergency response efforts. The preliminary results show that implementing DA techniques have improved the accuracy of the model in predicting damage in a different domain. The accuracy rises from 65% (without adapting the domain) to 70% when a simple domain discrepancy technique is adopted. We believe that implementing the DA approach can contribute to enhancing rapid assessment purposes for future events.

Building Vulnerability Analysis Due to Tsunami by Using Probabilistic Tsunami Hazard Assessment (PTHA): A Case Study of Pelabuhan Ratu, Sukabumi

Fauzan Ario, Celvin Pratama, Dhimas Thoriq Rizki Adipura, Teuku Muhammad Rasyif

Abstract

Cities that vulnerable to tsunamis, including the village of Pelabuhan Ratu on the southern coast of West Java, Indonesia, are in dire need of adequate vertical evacuation structures. However, constraints regarding to limited funding and difficulties in finding affordable land have hindered the implementation efforts of such structures in several cities. This research aims to analyze building vulnerability to tsunami disasters and identify buildings that can serve as alternative tsunami evacuation options based on Probabilistic Tsunami Hazard Analysis (PTHA) in Pelabuhan Ratu. The research methodology involves mapping the Modified Building Tsunami Vulnerability (BTV) and connecting the numerical simulation results with fragility curves assumed for the Pelabuhan Ratu area. The numerical simulations were conducted using the Cornell Multi-Grid Coupled Tsunami Model (COMCOT). Various tsunami scenarios triggered by earthquakes with different magnitudes ranging from 8.5 to 9.0, with intervals of 0.1, were considered in the numerical simulations. The research findings indicates high probability of maximum tsunami height reaching 14.85 meters in a return period of 10,000 years, and 51.77 meters in return period of 30,000 years. Based on these results, it was found that a three-story minimarket built with concrete could be used as an evacuation facility in a 10,000-year return period.

Keywords: Building Tsunami Vulnerability, COMCOT, Numerical Simulation, PTHA, Tsunami

Closing the Resilience Gap: A Preliminary Study on Establishing the National Fragility Curve Catalog for Multi-Hazard Assessment in Indonesia

Adrian Ulza, Yunita Idris, Cut Nella Asyifa, Rifqi Irvansyah

Abstract

This research paper presents a preliminary study aimed at closing the resilience gap in Indonesia through the establishment of a national fragility curve catalog for multi-hazard assessment. Indonesia is located in a high-risk hazard area, yet it currently lacks a comprehensive fragility curve catalog, which hinders effective risk assessment and mitigation strategies. By developing this database, the study aims to improve the understanding of structural vulnerability and enhance resilience planning across various hazards, such as earthquake, tsunami, wind, and flood. The research methodology involves collecting and analyzing data on the performance of different building types, exposed to multiple hazards. This includes considering various factors such as construction materials, design standards, and geographical characteristics. Statistical techniques and analytical modeling will be utilized to derive fragility curves that depict the probability of exceeding different damage levels or performance states given a specific hazard intensity. The findings of this study will provide valuable insights into the vulnerability of infrastructure and communities in Indonesia, enabling more informed decision-making for disaster risk reduction and resilience planning. The fragility curve database will facilitate quantitative risk assessments, support the development of appropriate building codes and standards, and inform the prioritization of mitigation measures. Ultimately, the establishment of a national fragility curve database will contribute to enhancing Indonesia's resilience to multi-hazard events and improving disaster preparedness at various scales.

Keywords. Fragility curve, Hazard and risk assessment, Indonesia

Parallel Session 3

10.30 - 11.45

Track 2 :
Inclusive Community Resilience and Disaster Education

Room 4 (D-402) Group 2-F

Moderator :
Ms Jessica Novia

Developing an android application for the Disability-Friendly Disaster Evacuation System (SIVABEL) based on local wisdom on Paseduluran Klaten Village

Siti Azizah Susilawati, Irma Yuliana, Siti Hadiyati Nur Hafida, Syilvia Mildiana Ningrum

Abstract

The research was conducted in Tegalmulyo Village as an affected village and Demakijo Village as a receiving village. Tegalmulyo Village has historically had a high risk of natural disasters. In contrast, Demakijo is a receiving village with excellent infrastructure and facilities. As detailed in a Regent's Decree, the Paseduluran Village concept has been implemented by BPBD Klaten to manage the Merapi eruption catastrophe since 2015. The concept of Paseduluran village is the brotherhood of two or more villages between villages with a high threat from the Mount Merapi disaster and villages deemed secure from Merapi's threat. However, the disaster management system quite well implemented by the Klaten BPBD is still not disabled-friendly. The research aims to develop a disabled-friendly evacuation application to make it easier for volunteers to carry out evacuations equipped with information on the distribution of disabled homes and their characteristics so that volunteers can prepare for evacuation according to the needs of people with disabilities. This research is developing an inclusive disaster evacuation android application by developing a disabled-friendly evacuation system based on local wisdom. This R and D research uses survey and interview methods for need analysis, design, and development. At the same time, the implementation phase is carried out through participatory action research involving the community and stakeholders. The first stage of the research was need analysis aimed at users, namely volunteers, people with disabilities, Paseduluran village officials and BPBD Klaten. The second stage is design and development, namely Android-based application development activities in the form of (1) mapping and constructing data on persons with disabilities in affected villages, (2) mapping of disabled-friendly facilities and infrastructure in recipient villages, (4) mapping disaster evacuation routes, (4) creating a Disabled-Friendly Disaster Evacuation System application (SIVABEL) with features from the results of the mapping that has been done. The third stage is application dissemination through a disabled-friendly Merapi eruption evacuation simulation using the Disabled-Friendly Evacuation System that has been created. The research results show a need for a user-friendly, disabled-friendly evacuation system for both users, namely disaster volunteers, village officials and the Klaten BPBD. The results of the development are in the form of an android-based SIVABEL application consisting of features (1) the distribution of residences and characteristics of persons with disabilities, (2) the evacuation route for the Merapi eruption from Tegalmulyo Village to Demakijo Village, (3) the distribution of disabled-friendly residential areas in the Village Demakijo (4) distribution of disabled-friendly infrastructure in Demakijo Village, (4) additional features in the form of telephone numbers for hospitals, and fire departments. The SIVABEL application was then implemented through a simulation of the Merapi eruption disaster, which was attended by disaster volunteers, people with disabilities, village officials, sub-district officials, health workers and the Klaten BPBD where based on the application assessment questionnaire given by them; they received a proper and good value to implement.

Use of communication media in inclusive water resources management by the Gunungkidul Disaster Resilience Forum (FDTB)

Andi Joko Prasetyo, Swita Amalia Hapsari

Abstract

This article discusses the use of communication media in inclusive water resources management by the Disability Resilience Forum (FDTB) Gunungkidul. Communication media has an important role in supporting the smooth communication process for each individual. Along with the development of modern technology, communication media also follow these developments. The author's aim in this study is to find out the communication media used by FDTB Gunungkidul in inclusive water source management. The research method used is a qualitative approach with a case study method. The author collected data through observation, in-depth interviews, and documentation studies.The results showed that FDTB Gunungkidul uses various communication media in inclusive water resources management. Print media such as pamphlets, banners, posters and letters are used as a means of information. In addition, digital media such as social media applications WhatsApp, Instagram, Youtube and online mass media are also used. The utilization of communication media is also supported through the socialization process carried out by FDTB members.

Keywords: Use, Communication Media, Water source Management, Inclusive, FDTB.

Using Community-led Innovation to Strengthen Inclusive Community Resilience and Promote Intergenerational Learning: A Study of Smart Mist Irrigation in Anticipating Drought in Gunungkidul District, Yogyakarta

Jessica Novia, Dhinar Riski Linggar Kingkin, Debora Dian Utami Nugraheni

Abstract

Community resilience has become a vision of disaster risk reduction efforts as explicitly mentioned in the aims of the Sendai Framework. It is not only to prevent new risks and reduce the existing risks that matter, but also to increase the community's ability to resist, absorb, accommodate, adapt to, transform and recover from the effects of a hazard in a timely and efficient manner. To do that, the community collaborates together with different stakeholders to increase their understanding of the impacts of hazards, their local capacity, social modality and environment to creatively tackle the problem while thinking about its sustainability. In order to address this issue, communities must work together to develop and implement innovative solutions. This study focuses on the use of Smart Mist Irrigation in Gunungkidul District, Yogyakarta, which is a community-led innovation to anticipate drought. The farmer community in Giriasih Village in Gunungkidul District, Indonesia, is an example of a resilient community. The district is experiencing a severe drought caused by the karst formation of the land, and the elderly and farmers with disability, who are the majority in the area, are particularly vulnerable to the impacts of the drought. Through the community-led approach, the farmer community has developed a smart mist irrigation system innovation, which is supported by the local village authority and other partners with both financial and non-financial assistance. Through this innovation they acquired new knowledge about water management and technology with local knowledge that could benefit the elderly, disability, and women farmers as well as involving the youth in the community to be actively involved. This paper will use a qualitative methodology to look at how the resilience of the Giriasih Village community has been enhanced by this innovation while promoting learning inclusively across generations to anticipate drought in the future. The findings of this study can be applied to other communities that are facing drought and can serve as a model for future initiatives.

Parallel Session 3

10.30 - 11.45

Track 2 :
Inclusive community resilience and disaster education

Room 5 (D-403) Group 2-G

Moderator :
Dr. Haekal Haridhi

Disaster Risk Reduction for Sexual Minorities: Current Status and Challenges in Japan

Miwako Kitamura, Anna Matsukawa, Anawat Suppasri, Punam Yadav

Abstract

The specific needs of sexual minorities in the context of disaster risk reduction (DRR) have received inadequate attention, with limited input from survivors themselves. This issue is particularly significant in disaster-prone Japan, where ensuring human rights during disasters is of paramount importance. This study aims to identify the distinct needs of sexual minorities during disasters and provide recommendations for effective information dissemination, establishment of safeguards, strengthening psychological support services, promoting active participation of sexual minorities in DRR planning, and raising awareness through educational initiatives. The findings illuminate the challenges encountered by sexual minorities during disasters and reveal specific needs and gaps within the existing disaster support system. These findings emphasize the crucial role of integrating sexual minorities into needs-based support and DRR strategies to ensure their safety, well-being, and resilience during disasters.

Keywords: disaster risk reduction, sexual minorities, LGBTQ+, inclusive information dissemination

Disaster Education through Socialization to the Community as an Effort to Build a Disaster-Resistant Village

Nurmansyah, Neneng Alghina Micha Grandisa

Abstract

Indonesia is a country that is located between two continents, namely Asia and Australia, located between the Indian and Pacific oceans. In addition, Indonesia is a confluence of the Indo-Australian, Eurasian, and Pacific plates, so Indonesia is a country that is vulnerable to disasters. BNPB (National Agency Disaster Management) released that in 2021 there were 3,092 disasters. The dominating disasters are floods, which account for around 42 percent of the total number of disaster events during 2021. Apart from floods, there were 804 extreme weather events, while other disasters were 45 tidal waves/abrasions and 1 mountain eruption. It was recorded that 8,426,609.665 people were affected and some of them died. There was an increase of 76% in patients who died compared to 2020. This indicates that public education about disasters is still lacking, resulting in many fatalities. Desa Berdaya Kembang is one of the villages that is prone to abrasion, flooding, and tsunamis due to its proximity to rivers and the sea. Therefore, disaster education is very much needed in the coastal village. Rumah Zakat through Relawan Inspirasi empowers the village by providing disaster education to improve the community's economy The research method is descriptive and qualitative which is located in Desa Berdaya Kembang and conducted in-depth interviews with the community and government. As a result, community disaster education increases and they understand how to use several technology-based services such as the Tsunami Early Warning System 4.0 (INATEWS). Another result is that the community and Relawan Inspirasi can take advantage of rivers, and beaches as an economic source through the Disaster Resilient Village.

Keywords: Disaster Education, Disaster Resilient Village, Empowerment

PREPARED training: awaken disaster volunteers' awareness of psychological disaster preparedness

Masnaeni Ahmad, Pradytia Putri Pertiwi, Rizanna Rosemary, Marty Mawarpury, Syafruddin Ali Salaka, Fega Pangestika, Arifatus Sholekhah

Abstract

The psychological aspect of disaster volunteer training in Indonesia has not been completely integrated. Disaster volunteers play a crucial role in both the evacuation process and reducing the potential hazards of a disaster. Through PREPARED training, an attempt has been made in this study to gain access to the knowledge, attitudes, and practices of disaster volunteers. The group participants consist of 90 volunteers from three regions., Mamuju, Banda Aceh and Sleman. The methods implemented in the PREPARED training include classes, tutorials, and field simulated events. Participants were given information about disasters in general, the concept of psychological disaster preparedness, instructions on how to use the PREPARED tool, and practice administering the PREPARED tool. There were significant differences on participants' knowledge as a result of the training. This is demonstrated by the substantial difference in participants' knowledge levels before and after the training (statistic= -10.7, $p<0.01$, statistic= -4.59, $p<0.01$). Disaster volunteers completing PREPARED training could have been more equipped to work with PREPARED tools and comprehend the context of psychological disaster preparedness. Disaster volunteers might subsequently employ the idea of psychological disaster preparedness to engage the community regarding management disasters.

Parallel Session 3

10.30 - 11.45

Track 2 :
Inclusive Community Resilience and Disaster Education

Room 6 (D-404) Group 2-H

Moderator :
Dr. Pradytia Pertiwi

School Disaster Resiliency and Recovery in Ishinomaki City, Miyagi

Bethany Meidinger

Abstract

This explanatory case study examines resiliency and recovery in Ishinomaki City, Miyagi Prefecture, following the Great East Japan Earthquake and Tsunami, with specific attention given to Watanoha Junior High and Ogatsu Elementary/Junior High schools. It examines the recovery efforts of local schools through the Three Pillars of Comprehensive School Safety (CSS): 1) safe learning facilities, 2) school disaster management, and 3) risk reduction and resilience education to evaluate how CSS expanded from pre-disaster. Using secondary data and mixed methods it inquires whether the measures taken were sufficient in strengthening resiliency without prolonged disruption to students' education, a focus that had been lacking in existing literature. By engaging students in the recovery efforts and centralizing the schools within the communities, the CSS pillars were not only strengthened but students' education was supported as well. Findings suggest that student and school resiliency strengthened as evidenced by improved graduation and enrolment rates.

Revisiting the concept of social vulnerability from the view point from evacuation behavior: Case study of Bali in Indonesia

Yasuhito Jibiki, Dicky Chresthover Pelupessy, Gusti Ayu Ketut Surtiari, Daisuke Sasaki, Taro Arikawa

Abstract

We aim to preliminary examine indicators of social vulnerability, from the view point of evacuation behavior. Particularly, we identify specific elements, which hamper evacuation behavior in tsunami, as a part of social vulnerability. In both research and practice, there are many definitions of social vulnerability. For example, World Risk Index, developed by the United Nations University Institute for Environment and Human Security (UNU-EHS), consists of susceptibility, lack of coping capacity, lack of adaptive capacity. Based on our observation, the existing indicators tend to rely on “objective” characteristics of social vulnerability. In our classification, the objective items are educational level and development progress of infrastructures such as seawall and road. However, in tsunami evacuation, components that are not merely objectively evaluated have critical relevance. For example, in educational level, in the existing social vulnerability, we often count the number of those who graduate from the primary educational service. But, it seems more important to assess if local people near the coastal lines understand routes to safer evacuation shelters. In another example, it seems much more important to perceive if the road condition is good for walking or any lighting is available for walking in the dark night. In our assumption, such perceived factors are relevant to examine social vulnerability in tsunami evacuation. In order to study social vulnerability in tsunami evacuation, we conduct literature review and interviews with stakeholders. For literature review, we compare the existing literature on social vulnerability with those of evacuation behaviors. Based on literature review as desk research, we clarify the objective and non-objective items of social vulnerability. In the interviews with the stakeholders, we collect reflections on the results of the desk research from practitioners and researchers in disaster risk reduction. In order to receive feedback from local people and communities, we focus on coastal areas in Bali Island of Indonesia. Considering a variety of the stakeholders, we reach not only government officials, but also non-governmental organizations, including representatives from communities and the local business sector. Reasons that we select Bali is that the coastal areas in Bali is exposed to tsunami, and evacuation drills and other types of educational efforts have been tested for many times. Furthermore, Bali accommodates a lot of tourists, and the local business sector has already started to prepare for ways to deal with the tourist. These local dynamics are considered as a suitable site to investigate social vulnerability in tsunami evacuation. The non-objective components of social vulnerability are critically reviewed and scrutinized through the Bali case study. Our research contributes to revisit and re-shape the aspects of social vulnerability for a basis of further empirical tests.

Transwomen Leading Covid-19 Pandemic Response: Experiences of an Indonesian Waria Community

Duma Manurung, Pradytia Pertiwi

Abstract

There is a lack of research on how Covid-19 pandemic affects transwomen populations in Indonesia, which creates a gap in understanding their vulnerabilities and resilience. Kebaya Foundation is an Indonesian Waria community that took part in responding to the Covid-19 outbreak in Yogyakarta in 2020. The initiative from Kebaya Foundation is timely following global agenda of leaving no one behind in DRR and humanitarian crisis underpinned by leadership of those most at-risk. Yet, there is limited scholarly evince that document the role and practice of the transwomen community in disaster response. This research aims investigate role and practices of Kebaya foundation in responding to Covid-19. A single case study method was adopted involving document reviews and semi-structured interviews with Kebaya Foundation staffs. The inquiry and analysis were guided by Pierre Bourdieu Social Practice theory. The data were analysed using thematic analysis and then we generate four themes related to role and experiences of Kebaya Foundation leading the Covid-19 response. This research shows that the Covid-19 pandemic increased the vulnerability of gender minority communities, while also providing opportunities for them to participate in emergency response efforts.

Parallel Session 4

13.00 - 14.15

Track 1 :
Hazard, Technology & Infrastructure

Room 1 (D-302) Group 1-I

Moderator :
Prof. Syamsidik

Tsunami resonance characterization in Bay Due to an Earthquake-Triggered Landslide: a case study in Ambon Bay, Indonesia

Kwanchai Pakoksung, Anawat Suppasri, Fumihiko Imamura, Tsuyoshi Nagazawa, Yukio Mabuchi, Yuuya Narita, Shohei Iwai, Tatsunori Nogami, Cipta Athanasius, Shuji Moriguchi, Syamsidik

Abstract

This study presents a comprehensive investigation into the characteristics and impacts of tsunami waves generated by submarine landslides in Ambon Bay, Indonesia. Through the integration of various data sources and advanced modeling techniques, we gained valuable insights into the dynamics of tsunamis in the region. Utilizing a two-layer model that considers seawater and fluidized granular material as distinct fluids, we accurately simulated the interactions between tsunami generation and landslide scenarios using slope stability analysis, yielding maximum tsunami amplitudes and arrival times. Spectral analysis through a fast Fourier transform revealed crucial information about the frequency characteristics, energy distribution, and oscillation patterns of the tsunami wave. Additionally, a Hovmöller diagram provided further understanding of wave reflections, edge waves, and their influence on the tsunami's duration along the coastline. By analyzing the Hovmöller diagram, the power spectral density was computed, revealing six prominent period bands: 5 min 13 sec, 4 min 36 sec, 3 min 45 sec, 2 min 40 sec, 2 min 15 sec, and 1 min 41 sec. The analysis of resonance modes identified regions prone to large oscillations, while computed spectral energy and peak period analyses showed energy concentrations and variability within the bay. Overall, this research enhances our comprehension of tsunami dynamics and informs coastal planning and disaster management strategies in Ambon Bay and neighboring areas in Eastern Indonesia. The findings have significant implications for mitigating tsunami risks and bolstering the resilience of vulnerable coastal communities

Assessing the Economic Losses Impact on Buildings Based on Tsunami Hazard in Banda Aceh, Indonesia

Muhammad Daffa Al Farizi, Syamsidik, Mubarak

Abstract

Tsunami, caused by undersea seismic activity, pose a severe threat to coastal areas worldwide. Apart from the loss of human lives, these colossal waves result in substantial economic damages. Their recurrence is tied to earthquakes, thus the probabilistic occurrence of tsunami resulting from earthquakes tends to have the same potential recurrence period as the earthquake events. The devastating tsunami that struck Aceh, Indonesia, on December 26, 2004, serves as a tragic example of the economic losses caused by tsunami. The tsunami's impact on Aceh's economy was profound, requiring long-term efforts to rebuild critical infrastructure and revive economic activities. Based on the 2004 tsunami event, it was learned that tsunami occur with the same return period as earthquakes. Therefore, this study is an extension aimed at identifying the economic losses resulting from a tsunami hazard. The tsunami modeling utilizes the numerical method COMCOT with a magnitude of 9.2 Mw. To assess building damage, the fragility function equation is employed to determine the percentage of damage to structures. We simulate the losses resulting from a tsunami with a magnitude 9.2 Mw, focusing only on buildings in Banda Aceh. The buildings are classified according to the Hazard United States (HAZUS). We have found that the losses caused by tsunami disasters on buildings are significant. This makes tsunami one of the disasters with a major economic impact. This information is crucial in determining the potential losses from disasters and estimating the expected maximum financial costs.

Coral Reef Response in the Maldives during the 2004 Indian Ocean Tsunami

Elisa Lahcene, Anawat Suppasri, Kwanchai Pakoksung, Fumihiko Imamura

Abstract

The impact of tsunamis on buildings or infrastructures has been globally studied. However, the relationship tsunami waves-marine ecosystems remains unclear. During the 2004 Indian Ocean Tsunami (IOT), damage to coral reefs were surveyed in the Maldives. Coral reef system is essential for fisheries, tourism and represent a natural coastal protection against large waves events, so it is urgent to better understand how the IOT impacted such an ecosystem. First, we reproduce the tsunami hydrodynamic characteristics along the Maldivian shores using TUNAMI-N2 model. We then define a database gathering all the post-tsunami reef datapoints. Third, we develop fragility curves for the reefs that have been impacted by the tsunami, based on the Global Earthquake Model (GEM) guidelines, for the maximum amplitude and flow velocity of the IOT. For example, when the amplitude and the flow velocity are higher than 1 m and 1 m/s, the probability to impact the reefs is 50%. Finally, we present a reef vulnerability map in Malé City and one of its surrounding Marine Protected Areas (MPAs). This work is the first attempt to quantify the tsunami impact on coral reefs using fragility curves. Based on the 2004 IOT, we aim to provide a better understanding of the reef response during a tsunami attack. These findings have implications for the development of long-term reef monitoring and strategies to enhance reef resilience against future tsunamis.

Parallel Session 4

13.00 - 14.15

Track 1 :
Hazard, Technology & Infrastructure

Room 2 (D-303) Group 1-J

Moderator:
Dr. Ella Meilianda

The impact of the forest land cover change to the hydro-meteorological disaster in the Palu watershed and it hazard mitigation action

Satrio Amrullah, Yusuf Susena

Abstract

The watershed have an important role on supporting human life and livelihoods and realizationing sustainable development. One of functions of the watershed, especially the upstream part, is to control and protect water management. Changes of land cover in watershed at the upstream area will have a significant impact on the downstream area. These impacts can be form of the fluctuations in river discharge, sediment transportation, and increase the risk of the floods, landslides or other hydro-meteorological disasters. Because of that it is important to monitor the condition of watershed regulerly, including Palu watershed in the Central Sulawesi Province. This study aims to analyze the effect of land cover changes, esspesialy of the forests, to the number of hydro-meteorological disaster events in the Palu watershed and to identify mitigation action to reduce the risks. This study uses a mix-method, both of qualitative and quantitative. Land cover change analysis is carried out spatially-temporally using remote sensing data. The data used is land cover data in 2014, 2018 and 2022 which were obtained from the supervised classification process of Maximum-Likehood methode to the Landsat 8 OLI imagery. Hydro-meteorological disaster events are also analyzed spatially-temporally based on data sourced from BPS and BNPB. Meanwhile, disaster management actions were analyzed based on data from in-depth interviews with BPBD Sigi Regency. The results showed that land cover changes of the forest in the Palu watershed contributed positively to the hydro-meteorological disasters event. It is can be seen from the number of disaster that increase along with the reduced amount of forest land cover. In general, the number of hydro-meteorological disasters in the Palu watershed has increased every year, but the number of victims has decreased significantly. These findings show that the hazard mitigation actions carried out by the Sigi Regency government are effective in reducing the impact and the risk of disasters in the area.

Developing continuous topo-bathymetric elevation models of tsunami-prone areas in Indonesia: A focus study on Bali province

Constance Chua, Muhammad Rizki Purnama, Mélanie Masson, Anawat Suppasri, Fumihiko Imamura

Abstract

To support coastal monitoring, modelling of coastal floods and tsunami in Indonesia, a joint-research initiative was established between Indonesia and Japan – the SATREPS BRICC “Building Sustainable System for Resilience and Innovation in Coastal Community”. High-resolution and continuous elevation model (DEM) from deep sea to the shore is essential to accurately map coastal changes, monitor environmental changes as well as model coastal hazards such as floods, sea level rise, storm surges and tsunami. The availability of such data is limited in many areas within Indonesia. The objective of this study is to develop high-resolution, cost-efficient, and continuous topo-bathymetric model for flood and tsunami-prone areas in Indonesia, with Bali province as a case study. Currently, topography models (DEMNAS) and bathymetry models (BATNAS) provided by local agency, Badan Informasi Geospasial, are freely available for all of Indonesia, and a straight-forward solution would be to merge these two datasets through interpolation methods. However, such an approach is challenged by three key limitations: (i) differences in spatial resolution of the two datasets, (ii) differences in vertical reference systems, and (iii) data gaps in shallow water and subtidal areas. Collection of depth data in the shallow water region is constrained by manpower requirements, environmental conditions, changing tides, accessibility and navigational restrictions. In recent years, remote sensing techniques have been widely tapped into to overcome these limitations. In this study, we capitalise on freely-available data by firstly using satellite imagery to derive shallow water topography and combining our models with DEMNAS and BATNAS models to develop a seamless topo-bathymetric model for Bali. It is in our hopes to establish a standardised approach of developing continuous topo-bathymetric models for the rest of Indonesia.

Tsunami Hazard Mapping and Evacuation Path Determination Using Field Survey and Geographical Information System at Widarapayung Wetan, Cilacap

Nurvita Fatmasari, Irfa Destrayanti, Berlian Utaminingtyas, Hery Susanto Wibowo

Abstract

In 2006, a tsunami hit Pangandaran, and its effects were felt in Cilacap. There were 664 fatalities, 498 injuries, and 55 million dollars in damages, and 1623 homes were destroyed or severely damaged due to the tsunami. Furthermore, the village of Widarapayung was among those devastated by the tsunami, which reached a height of up to 5 metres and claimed the lives of 12 people. In addition, Widarapayung is a popular tourist destination and one of the venues for 2019's professional surfing events. Therefore, disaster prevention measures are essential to lessen the impact of disasters and save lives. The objective of this study is to assess the vulnerability of the Widarapayung Wetan area to a tsunami and make recommendations for evacuation routes and regional infrastructure development to reduce casualties and damage. This research utilised COMCOT to model the megathrust segment with a possible magnitude of 8.6, with worst-case values acquired from the catalogue PuSGeN 2017. Additionally, the data on topography and bathymetry collected by DEMNAS and BATNAS are utilised in this investigation. The modelling results indicated a 50-minute arrival time for the tsunami waves, a maximum run-up height of 14-18 metres, and a submerged area of roughly 4.57 km2. In addition, the most effective evacuation routes were determined by comparing the outcomes of field surveys and Geographic Information System simulations. This research will provide local governments with helpful information for making informed decisions about infrastructure and spatial development in the future. Keywords: Tsunami, Evacuation Map, COMCOT, Run up

Parallel Session 4

13.00 - 14.15 WIB

Track 3 :
Urban planning, reconstruction and recovery

Room 3 (D-304) Group 3-A

Moderator:
Dr. Elizabeth Maly

Digital Technology as a Resilience-Enhancing Tool for SMEs in Earthquake-Prone Developing Countries

Syafruddin Chan, Jalaluddin, Kurnia Asni

Abstract

The frequent earthquakes in Aceh, Indonesia, have not only posed a medical emergency but have also resulted in a business emergency, demanding organizations to exhibit adaptability and resilience in mitigating the impact on their operations. Small- and medium-sized enterprises (SMEs) are particularly vulnerable due to their limited resources to cope with losses. This research focuses on examining how digital technologies contribute to the resilience of SMEs, specifically in developing countries, during the pandemic. By surveying 30 SME owners in Indonesia, this study reveals that digital technology has played a pivotal role in enabling SMEs to survive the pandemic, fortifying their operations, and ensuring their continued existence. The findings address a significant gap in the existing literature by shedding light on the specific challenges confronted by SMEs in developing countries and their strategies for digital transformation. Drawing from the preliminary study, two practical recommendations emerge. Firstly, SMEs are encouraged to invest in the adoption and integration of digital technology across various facets of their operations. This encompasses leveraging digital communication channels, utilizing cloud computing and e-commerce platforms, harnessing data analytics for informed decision-making, and exploring automation where applicable. Embracing these digital tools and practices empowers SMEs to enhance operational efficiency, elevate customer engagement, and adapt effectively to evolving market dynamics. Secondly, tech developers and policymakers must support SMEs on their digital transformation journey. Tech developers can contribute by developing user-friendly and cost-effective digital solutions tailored to the needs of SMEs in developing countries. Policymakers, on the other hand, can foster an enabling environment by enacting supportive policies, providing financial incentives, and promoting partnerships between SMEs and technology providers.

Creating an Ecosystem that enables acceleration of housing self-recovery in the post-disaster context

Arwin Soelaksono

Abstract

During reconstruction, the recovery actors might overlook the connections between external and internal push factors. These factors can positively impact the processes to accelerate and produce long-term benefits beyond construction. Consequently, the ecosystem which should strengthen the self-recovery initiatives cannot be formed. Whereas, inside the ecosystem, the function of the market can be amplified by government policies and strategies. External push, such as using contractor companies and imposing deadlines, can speed up the reconstruction but will have problems both in sustainability and inclusivity. Government or aid agencies might set deadlines for the reconstruction program. It might happen if all support systems are in place. A deadline is inevitable since the recovery program might be ended due to program closure. But expecting that imposing the deadline will accelerate the process will only be partially effective. On the other hand, applying the push factors need to pay attention to the nature of the genuine housing recovery, i.e., self-recovery initiatives and local market capacities. Hence, those initiatives and capabilities should be strengthened by internal push. The capacities of the market actors, which are the architects, engineers, builders, hardware stores, and even homeowners, should be strengthened to meet the demand for massive reconstruction.

Parallel Session 4

13.00 - 14.15 WIB

Track 4 :
Disaster society, culture and history

Room 4 (D-402) Group 4-A

Moderator:
Ms Masnaeni Ahmad

Climate crisis, climate-related disaster, and sexual, reproductive and maternal health: a participatory arts-based project in Yogyakarta, Indonesia

Jamee Newland, Elan Lazuardi

Abstract

Problem statement The climate crisis is identified as one of the biggest global health threats of the 21st century, disrupting livelihoods and disproportionately affecting people living in the Indo-Pacific Region. The impact of the climate crisis on sexual, reproductive, and maternal health (SRMH) is a relatively new area of investigation, but even in this short period of time the findings paint a dire picture. Climate crises disrupt public health infrastructure and service provision, degrade reproductive tracts and sperm viability, and increase pregnancy loss, preterm birth, and congenital birth defects, HIV and STI prevalence, child marriage, and sexual- and gender-based violence - findings that are disproportionately gendered. Addressing the climate crisis as one of the drivers of climate-related disaster risk is critical, however, what we don't know is how communities understand these risks nor the types of responses community believe are important for ameliorating risks and building resilience. Methods This project attempts to fill this knowledge gap through a novel and intersectoral partnership in Yogyakarta Indonesia; comprised of UNSW UGM, PKBI DIY, artists, and community. Using an arts-based approach, we aim to refocus on the cultural contexts of health, climate crisis and climate-related disasters through two art modalities –wayang kulit and street art. Twelve street artists and 12 women were recruited to work with a facilitator to produce and curate art that was exhibited and performed in a community-controlled art gallery for one month. Each art modality had a project event and a facilitated public discussion. A fusion of data collection methods was undertaken to explore the project aim, including gallery sign in book, street art and their descriptions, women's individual stories, women's wayang co-produced story, the wayang performance, public discussion questions and responses, and interviews with artists and audience. Results This presentation showcases the street art and wayang kulit and describes the process undertaken to produce, curate and exhibit this art. It will also present the draft results exploring the different meanings and understandings attached to climate crisis, climate-related disaster and SRMH from the perspective of the artist and the audience, including how artists conceptualize, interpret and produce works on climate crisis, climate-related disaster and SRMH. As well as how community understand and experience SRMH during climate crisis and disaster events, paying particular attention to their needs, priorities, and to the critical roles and responses required to attend to these crises *. Contribution Arts-based approaches are transformative and should be considered in the broader disaster risk reduction field. They can be effectively implemented, replicated, and scaled up in low-resource settings. These approaches de-centre disaster risk reduction by locating the storytelling in the hands of community - enabling the creation of a world of new knowledge that is grounded in indigenous knowledge and the lived experience of communities. Arts-based approaches are inclusive, bridging the growing gap between research and practice by engaging people in their communities and mobilising civil society, researchers, and policy makers to work together to move the narrative beyond risk to one of resilience and climate justice. Submission type: abstract and presentation *This project in in process. Key draft result thematic areas will be analyzed and draft findings will be presented after the project exhibitions in July/August 2023 – the abstract can/will be updated when these are known.

Exploring the Existence of Local and Indigenous Knowledge for Disaster Risk Reduction: Research Landscape in Indonesia

Fathia Lutfiananda, Ainur Ridho, Radikal Lukafiardi, Fega A. Pangestika, Mizan B. F. Bisri

Abstract

Culture’s significant role in disaster reduction has been recognized in the Sendai Framework for Disaster Risk Reduction. Some of the cultures practiced by local-indigenous communities are recognized as Local and Indigenous Knowledge (LIK), which enables the communities to respond, recover, mitigate and prepare for disasters. With LIK pivotal roles in disaster risk reduction (DRR), this research aims to deliver a comprehensive review of published research articles focused on LIK in Indonesia’s DRR. The paper analyses articles collated from various repositories through CARI’s portal. These research articles are selected based on specific keywords, disaster management stages, hazard types, and focused on articles written in English and Bahasa Indonesia. Our findings show that the existing articles are mainly concentrated in Java and Sumatra regions. The disparity of published articles is seen in the remaining provinces, with fewer than 30 articles. Based on the network analysis, this review finds diverse research clusters related to LIK, such as climate-related hazards, community-vulnerability, -engagement, structural building, and Aceh and Tsunami-related research. Based on the findings, we recommend to develop nationwide cooperation to identify and mainstream LIK on DRR, redistributing LIK research focus areas, and engage with local communities to ensure authenticity LIK’s translation. Keywords: local knowledge, indigenous knowledge, disaster risk reduction, systematic review, CARI Engine

Memory, Meaning, and Monuments: An Ethnographic Study of Tsunami Memorialization in Aceh

Alfi Rahman, Muzayin Nazaruddin, Sébastien Penmellen Boret, Yuva Ayuning Anjar, Rizanna Rosemary, Rosaria Indah, Syahrul Ridha, Siti Ghaisani Masturah

Abstract

The Indian Ocean tsunami of December 26, 2004, left an impact on Aceh, Indonesia, prompting the establishment of tsunami memorials to preserve collective memories. This study examines how individuals and communities interact with tsunami memorials in Banda Aceh and Aceh Besar. It seeks to understand the dynamic intersection between individual, community, and tsunami memorials using three memory theories: collective, instrumental, and vicarious memory. Findings reveal that memorials serve as spaces of recollection, fostering connections with lost loved ones and reinforcing disaster resilience.However, memory erosion occurs over time due to generational shifts and social dynamic changes. Instrumental and vicarious memory theories elucidate memorials' broader societal roles, promoting disaster education and empathy. Beyond commemorations, memorials become cultural symbols shaping memories, meanings, identities, and narratives. This research highlights the importance of nuanced memorialization strategies to sustain engagement, foster disaster risk reduction strategies, and honor collective memory.

Sustainability Issues of Digital Archives of the Great East Japan Earthquake Sustainability Issues of Digital Archives of the Great East Japan Earthquake

Akihiro Shibayama, Julia Gerster

Abstract

The Great East Japan Earthquake of 2011 is the largest example of a single disaster event for which digital archives related to natural hazard disasters have been established. Dozens of organizations have been active in the aftermath of the Great East Japan Earthquake, collecting all kinds of records related to the disaster, and more than 50 digital archive websites have been opened to the public. However, 12 years after the Great East Japan Earthquake, already five organizations have closed their websites. The closed organizations include two consortiums, one corporation, one company, and one municipality. Although there are various reasons for their closure, we believe that there are two major reasons. One is "organizational issues" and the other is "systemic issues." "Organizational issues" are those that are difficult to maintain due to problems in the management organization, changes in personnel, or changes in policy. Next, "systemic issues" are those that are difficult to maintain due to necessary hardware replacements connected to their performance life, security issues and software updates, and long-term preservation issues including migration of content data. In order to resolve these issues, they both have in common the cost of personnel and systems for maintenance and management. There is a possibility that digital archives related to the Great East Japan Earthquake will decline or even disappear in the future. However, the National Diet Library, Tohoku University, and other organizations are working to save digital archives in order to change this trend. There are also cases where new digital archives have been constructed 12 years after the earthquake. This report describes the current status of the closure of digital archives 12 years after the Great East Japan Earthquake, the rescue of digital archives, and the new development of digital archives. Analyzing the differences in the backgrounds of disaster digital archives that were forced to close, and those that managed to stay in operation will give valuable insights in managing digital archives in sustainable ways.

Parallel Session 4

13.00 - 14.15 WIB

Track 4 :
Disaster Society, Culture and History

Room 5 (D-403) Group 4-B

Moderator:
Dr. Pradytia Pertiwi

The Temporality and Symbolic of Memory-Scape in Post-disaster Communities: A Study of the Monuments for the Victims of the Great East Japan Earthquake

Sebastien Boret

Abstract

Since the catastrophe on March 11, 2011, hundreds of memorial sites have sprouted up along the ravaged coastline of northeast Japan, from temporary wooden poles to imposing structures of black granite. These sites include stones for the souls of the dead (ireihi). Ireihi constitute places of ritual where mourners, survivors, and other visitors may join their hands (tewo awaseru) to honour the dead. During the years that followed the tsunami, these places became focal points of grief, memories of the catastrophe, expressions of solidarity and hope for the renewal and safeguarding of the affected communities, as well as a reflection of the relationship between human and nature. This chapter attempts to understand the dynamics and the meaning of this landscape of memorialisation. It considers the processes that led to the creation and transformation of formal and informal memorial sites for the victims of the devastated community of Yuriage, the coastal area of the city of Natori in Miyagi Prefecture. This chapter shows how the memorialization of the dead that flourished on the deserted land constituted the first human activities through private and public installations. It concludes that disaster sites are as much about the memorialization of the past as they are the symbolic representation of continuums and breaking points between nature and culture.

Cocreation Phase-Free BOSAI Class in Triangle Model and its Digitalization: A Case Study in Elementary School in Japan

Ryo Saito, Koichi Sugawara, Nana Hasegawa, Akihiro Aotani, Mari Yasuda, Takashi Oda, Fumihiko Imamura, Toshiaki Muramoto

Abstract

Developing effective, meaningful, and sustainable BOSAI education classes in schools is a significant challenge faced by the international community. The aim of this study was to enhance the BOSAI class previously developed by Saito (accepted). This study further developed the BOSAI class by incorporating the Phase-Free and Triangle Model (collaboration among researchers, school teachers, and children) and adopting a Digital Transformation perspective. This BOSAI class was conducted with fifthgrade students in Japanese elementary schools (four-class, n = 120). The purpose of the class was to understand the nature of human cognition and behavior (specifically focusing on cognitive biases). An evaluation of the class was conducted based on the changes in scores between pre- and post-class questionnaires. The survey forms included items related to both general mindset and BOSAI mindset. The score differences in the questionnaire items between the pre- and post-lesson were statistically significant. These findings suggest that the BOSAI class in this study effectively impacted both the general mindset and BOSAI mindset of the children

What Makes A Community Stronger in the Face of Disasters and Its Risks: A Case Study of a Small Community during the 2018 Heavy Rain and Floods in Western Japan

Hyejeong Park

Abstract

The Heavy Rain Event of July 2018 (28th June to 8th July) brought unexpected and unprecedented torrential rains to various parts of Japan due to complex climatic conditions, including effect of a typhoon, humid air streams, Baiu front, and liner rainbands. In western Japan, the precipitation reached approximately 900 – 500 mm from the 5th to the 8th of July 2018. This extreme rainfall resulted in river overflows, levee failure, large-scale flooding, landslides, social infrastructure destruction, and severe economic losses. Tragically, 219 people lost their lives across 14 prefectures, at the same time, more than 8 million residents were under immediate evacuation advisory and recommendation. Additionally, a significant Natech (natural hazard-triggered technological accident) occurred in Shimobara town, located in Okayama Prefecture, where floodwaters caused a severe explosion in an aluminum recycling plant. During the 2018 event, the occurrence of cascading disaster in wide areas caused a significant lack of first responders who could aid and rescue local residents. Despite facing heavy rain, floods, and a Natech accident, the residents of Shimobara town managed an effective and decisive evacuation based on their past experiences and community disaster risk reduction activities. Their prompt response led to no loss of life and demonstrated the significant contribution that a disaster-resilient community can make in mitigating disaster risks and damages. Thus, this study aims to investigate the factors that contribute to the preparedness of the local community for unpredictable disasters. Practical information and data were collected from residents of Shimobara town through in-depth interviews, focus group discussions, field notes, and document reviews. Thematic analysis was employed to analyze collected data and identify key roles of the local community that make the residents more resilient than other affected local communities. The results are classified into six categories: 1) key actors in community disaster risk management; 2) bridges for risk communication between local stakeholders; 3) observers responsible for monitoring risks and hazards; 4) decision-makers based on identified community resilience, including a sense of community, trust, and indigenous knowledge; 5) assistants for local disaster risk management and reduction; and 6) liaisons for coordination and collaboration with other stakeholders. These have been cultivated by the residents of Shimobara town over several decades and active community engagement in disaster risk reduction. These findings underscore the importance of local communities' roles in disaster risk management and reduction, as their activities and coping capacities, which make the local community stronger and more resilient to disasters, should never be underestimated in preparing for future disasters.

Parallel Session 5

13.00 - 14.15 WIB

Track 1 :
Hazard, Technology & Infrastructure

Room 1 (D-302) Group 1-K

Moderator:
Dr. Ella Meilianda

Influence of Tides Level on Tsunami Hydrodynamic in Banda Aceh, Indonesia

Tursina, Syamsidik, Shigeru KATO, Mochammad Afifuddin

Abstract

Tides are the dominant physical process in the coastal environment. During high tide, water from the ocean flows through the bays and estuaries, causing inundation and raising water elevation. When low tides condition, the water level becomes lower than average and recedes into the sea. This process continues for a long day. Tsunami waves will interact with all coastal processes and affect the hydrodynamic forces of tsunami waves. In the deep sea, tides do not significantly influence wave propagation. However, in the shallow water zone, tides can change tsunami heights and affect the extent of inundation. Tides are usually ignored in tsunami hazard analysis. This would be an underestimate of the tsunami hazard calculation. This study aims to investigate tides' influence on tsunami runup hydrodynamics in Banda Aceh. The potential tsunami from an earthquake in the Aceh-Andaman subduction zone is modeled using COMCOT (Cornell Multi Grid Coupled Tsunami Model) with magnitudes Mw 9.2, 8.6, and 8.2. We simulated the response of the three earthquake magnitudes on two different types of high and low tides. Several virtual gauges were placed to observe the tsunami height. Virtual gauges were also used to observe the tsunami arrival time at four tsunami escape buildings in Banda Aceh: the Ulee Lheue escape building, the Deah Glumpang escape building, the Alue Deah Teungoh escape building, and the Lambung escape building. The results show that the high tide amplifies the tsunami heights and influences the extent of the tsunami inundation. The interactions between tsunami and high tide significantly shorten tsunami arrival time on small magnitude tsunamis and are not significant in a large tsunami. This information is useful for enhancing early warning systems and evacuation procedures that can be adjusted to the tidal conditions in the study area.

Keywords: tsunami-tide interaction; escape building; tsunami maximum; tsunami arrival time; numerical simulation.

Towards a decentralized Multi-Hazard Early Warning System for tourism and coastal communities in Lombok

Mujiburrahman Thontowi

Abstract

Lombok Island, located in Indonesia, has a history of natural disasters, including volcanic eruptions, tsunamis, earthquakes, and pandemics, impacting the tourism industry and coastal communities. The island's significance is heightened by the Mandalika Tourism Site for Motor Gran Prix, situated in a tsunami-prone region. While the need for a multi-hazard early warning system is evident, the absence of legal requirements poses challenges in its implementation, in contrast to single hazard warning systems with robust legal frameworks. The research aims to propose a decentralized multi-hazard early warning system for tourism and coastal communities in Lombok. The objective is to leverage emerging technologies to provide real-time information on potential disasters, enhance safety, and improve resilience. The study involves collaboration with local government stakeholders, the tourism sector, and local communities. It includes observations at the Emergency Operations Centre and Volcano Monitoring Post, elite interviews with government officials, and focus group discussions with community members in Lombok during 2020. The research demonstrates the potential of the proposed multi-hazard early warning system to significantly improve safety and resilience on the island, safeguarding both locals and visitors from harm. Establishing a legal framework is crucial for operationalizing the multi-hazard early warning system effectively. The involvement of local tourism groups and businesses is essential in building resilience, utilizing local wisdom. Community engagement plays a vital role in enhancing understanding of risks and response capabilities. Collaborative efforts with international and local non-government agencies, along with the contributions of Mataram University, have strengthened disaster response in coastal regions. In conclusion, the proposed multi-hazard early warning system holds promise in enhancing safety and resilience on Lombok Island, but it requires legal support and community involvement for successful implementation

Suggestion on Developing Indonesia Tsunami Observation Network for Java Megathrust based on Stochastic-slip Tsunami Simulation

Muhammad Rizki Purnama, Anawat Suppasri, Fumihiko Imamura, Constance Ting Chua

Abstract

Past tsunami events from the Java subduction zone shows us a huge losses and damages in coastal area that covers this fault, such as Pangandaran and Banyuwangi events. This zone is also covers most of the dense area as well as notable area span from Java to Nusa Tenggara such as tourism areas, fisheries, villages, and ports. A decent coastal monitoring system has an important role to issue not only effective early warning system that covers this area, but also its rapidity. It is also notable that Indonesia has only five tsunami observation network that lies in the bottom ocean of South Java through Nusa Tenggara. Through a joint-research program between Indonesia and Japan, SATREPS BRICC “Building Sustainable System for Resilience and Innovation in Coastal Community”, we develop a new suggestion regarding the deployment of the Indonesia tsunami observation network to support future coastal monitoring and resilient communities in Indonesia. In this paper, we assessed the initial deployment of tsunami observation network along The Southern part of Java Island to Nusa Tenggara. We develop the initial location by analysing the possible location by elaborating the contour of the location and the result EOF analysis based on tsunami numerical modelling. First, we create a set of synthetic tsunami scenarios using a stochastic-slip earthquake model to generate multiple tsunami-earthquake scenarios. We have also emphasize the seismic gap along the fault to appropriately plot the generated slip for each defined-grid. Next, we apply the empirical orthogonal functions (EOF) based on the all of stochastic-slip earthquake-induced tsunami simulation. We hope that this project will lead to the advancement of future coastal monitoring as well as early warning system in Indonesia.

Social Vulnerability and Regional Capacity of the Cilegon City and Sedang Regency from Tsunami Hazard

Diyah Krisna Yuliana1, Ritha Riyandari, Zulfa Qonita, Bambang Marwanta, Dwi Abad Tiwi, Marina C. G.Frederik, Astisiasari Astisiasari

Abstract

The resiliency of a region against a tsunami wave may be described by its level of social vulnerability and capacity. Historically, the Cilegon City and Serang Regency experienced several tsunami events with innumerable losses, which indicate low resiliency. The research locations focused on five districts in the Cilegon City and Serang Regency; there are 30 villages and the village area is used as a unit of analysis. Quantitative data analysis using scoring and weighting factors is used to measure the level of social vulnerability and regional capacity. To distinguish social vulnerabilities and capacities among the villages, a classification scheme was conducted, namely low, moderate, and high. The results show Citangkil Village has the highest level of social vulnerability with a score of 0.899. Meanwhile, Mangunreja Village has the lowest with a score of 0.054. The Argawana Village achieved the highest level of regional capacity with a score of 0.965. On the other hand, Samang Raya Village has the lowest with a score of 0.540. This study shows that a high level of social vulnerability is directly affected by population density, meanwhile, a high level of regional capacity is strongly influenced by disaster preparedness, disaster prevention, and mitigation

Parallel Session 5

14.30 - 15.45 WIB

Track 4 :
Disaster Society, Culture and History

Room 2 (D-303) Group 4-C

Moderator:
Ms. Masnaeni Ahmad

Safeguarding Lives: Exploring Indigenous Knowledge and the Smong Phenomenon in Aceh's Tsunami Resilience

Alfi Rahman, Muzayin Nazaruddin, Nurul Fajar Januriyadi

Abstract

Smong is an indigenous knowledge related to tsunami, and it functions as a remarkable example of how local and indigenous knowledge benefited saving the Simeuluean people from the Indian Ocean tsunami in 2004. This research was conducted to deepen our understanding of the narratives, practices, and indigenous knowledge of the Acehnese people facing tsunamis. The study employed a qualitative approach and was carried out in multiple regions in Aceh, namely Banda Aceh, Aceh Besar, Aceh Singkil, and Simeulue. The research focused on refining the concept and framework of local and indigenous knowledge dynamics as disaster narratives by accumulating perspectives from diverse sources. Data collection was accomplished through ethnographic methods and semi-structured interviews with key informants. The collected data was then analyzed using techniques such as narrative analysis. The research primarily aimed to determine the existence and development of local and indigenous knowledge related to the tsunami in Aceh. To complement the data, observations and follow-up interviews were conducted to augment the previously assembled information. Mapping the local and indigenous knowledge of the Acehnese people in dealing with the tsunami threat remains fitting in the context of Aceh. The research deepened the understanding of the narratives of local and indigenous knowledge of the Acehnese people in their response to the tsunami, providing worthwhile insights for disaster management strategies. The analysis indicated the importance of melding local practices and knowledge into disaster risk reduction efforts, underlining the need for partnership between the government, local communities, and related stakeholders. Reinforcing the role of local knowledge requires extensive support, particularly from the government, to incorporate it into education, cultural preservation, and disaster management policies. The research underscores the significance of indigenous knowledge in specific contexts. It highlights its potential for enhancing disaster resilience in Aceh and other regions encountering similar threats.

Validation of internal structure of the PREPARED Tool (Psychological Preparedness of At-Risk Indonesian Communities to Disaster)

Latifa Resmiya, Pradytia Putri Pertiwi, Lavenda Geshica, Maria Magdalintan Kalvari Puspita Maraji's

Abstract

Psychological preparedness for disasters has become an important topic alongside physical preparedness. However, there has not been a clear definition of psychological preparedness for disasters. And there are only a few instruments of psychological preparedness for disasters. In response to the lack of studies on instruments or measurements tool for psychological preparedness for disasters, particularly in Indonesia, the PREPARED (Psychological Preparedness of At-Risk Indonesian Communities to Disaster) Tool was developed. The PREPARED Tool was developed to assess psychological preparedness that affects an individual's ability to anticipate uncertain future events such as disasters, including that related to health, such as COVID-19. The PREPARED Tool consists of three factors and fifteen psychological constructs, with a total of 41 items. The PREPARED instrument has undergone expert testing and field trials with a Cronbach's alpha reliability coefficient of 0.912. However, there have been no further studies on the validity of the PREPARED Tool. As a result, this study aims to investigate the validity of the PREPARED Tool using Evidence Based on the Internal Structure. The validation was conducted using secondary data from field trials of the PREPARED Tool with 704 participants from Banda Aceh, Sleman, and Mamuju. Validation of the internal structure of the PREPARED Tool using Confirmatory Factor Analysis (CFA) and Multi-group Confirmatory Factor Analysis (MG-CFA) with JAMOVI version 2.3.21. This study is expected to be a reference in using and developing instruments of psychological preparedness for disasters, as well as an evaluation of disaster preparedness programs in Indonesia.

Memories of a Papuq Project: Developing Content Knowledge on Indigenous Disaster Risk Reduction in the Southern Coastal Areas of Lombok Island

Toni Ariwijaya, Lale Fatma Yulia Ningsih

Abstract

Disaster risk reduction policies in developing countries had been known to be carried out using scientific knowledge while ignoring the values of indigenous knowledge in the field (Gaillard & Mercer, 2012; Rist & Guebas, 2016). Indigenous knowledge is usually underappreciated as it is viewed in some quarters as inferior to scientific knowledge. However, there has been called for generations to mitigate hazards and reduce disasters in local communities (UNISDR, 2005). The 2018 earthquake has been a wake up call for Lombok people. However, the post-quake reconstruction programs have been so much emphasised on the physical reconstruction while in terms of disaster education children have been barely exposed to local narratives on disaster risks reduction and management at the expense of internationally known disaster risk reduction lessons. Therefore, there is a need to research and gather the narratives to be able to keep the narrative culture afloat, to generate a more contextual disaster-related lessons and avoid their extinction of the narratives by taking into account the role of women, linguistically, as a better story teller compared to their male counterparts. The project aims to research and gather local narratives on indigenous risk reduction management which has long been practiced by the local elders yet start to extinct. The narratives were extracted into a children-friendly book (comic) both as a means of teaching resources for local teachers and as a book to read by students themselves. “Papuq” in the local language means grandmother which resonates this project as to bringing back the elders’ memories on disaster mitigation such as when the 1977’s Sumba earthquake causing tsunami which affected southern costal regions of Lombok. The project was administered by Australia Awards Indonesia through Alumni Grant Scheme funding started from 2020 to 2022. In doing so, 20 ‘papuq’ living across the area had been the main participants to gather data and narratives through interview and be followed by FGD to validate the narratives gathered. Then, three pictorial books showcasing the narratives are published and the copies were distributed to local elementary schools around South Lombok. The books were also launched during a “story telling by the beach” event on 23 July in celebrating Children’s Day. Keywords: content knowledge, indigenous disaster risk management, Lombok coastal areas

Understanding the psychological preparedness of at-risk Indonesian communities to disasters

Pradytia Pertiwi, Rizanna Rosemary, Marty Mawarpury, Masnaeni Ahmad, Fega Ayu Pangestika, Arifatus Sholekhah, Syafruddin Ali Salaka

Abstract

To date, individual and community-based preparedness initiatives have been largely focused on physical and material aspects, and there are only limited studies and initiatives to assist community on understanding psychological preparedness to disasters in the Indonesian context. Whereas scholars have argued that higher levels of household psychological, or mental preparedness are associated with greater material preparedness, more effective stress management during disaster events, and decreased likelihood of experiencing post-disaster mental health problems. This study aims to: (1) explore characteristics and psychological constructs that influence people's ability to anticipate uncertain future events such as disasters, including health-related such as COVID-19, from published literature; and (2) develop, for the first time, a tested-tool for psychological preparedness to disaster in Indonesia context as a process tool for communities get the facts and to make a plan about the need for psychological aids and assistance in case of disasters events. The study adopted a multi-method approach combining a scoping review, psychological instrument development and a quantitative analysis field validation using Confirmatory Factor Analysis (CFA) to determine reliability and validity of psychological preparedness to disaster tool. Scoping review identified nineteen constructs of psychological preparedness to disaster, from which psychological preparedness to disaster tool was developed comprising 80 question items with binary answers. Expert review with four experts in disaster psychology and psychometrics determined 41 question items were valid across 15 constructs with Aiken V score between 0.92 – 1. Field validation of the tool was held in hybrid mode involving 704 participants across three disaster-risk area of Banda Aceh, Sleman District and Mamuju District, including at-risk groups such as the elderly, people with disabilities, people with mental illness, people living with HIV and AIDS, and survivors of sexual violence. Reliability test resulted in Alpha Cronbach coefficient of 0.912, and CFA resulted RMSEA score 0.493 that indicating that the psychological preparedness tool is ready to be widely used in its current form. Field validation results further provides insights into level of psychological preparedness of communities in the three areas. The majority of participants in the three regions had a moderate level of psychological preparedness (N: 319). And no individual has a very high level of psychological preparedness. It was found that there was significant difference in the psychological preparedness of the participants in the three regions ($p<0.01$). Similarly, there is a significant difference ($p<0.01$) in scores between at-risk communities and non at-risk communities, with the latter had a higher level of psychological preparedness. The study is limited in understanding factors that cause differences in the level of psychological preparedness, therefore it is suggested that further qualitative exploration on this topic is needed. Nevertheless, the tool has the potential to inform better understanding of psychological preparedness to disaster, to draw action-oriented recommendation that feed into building the disaster preparedness of Indonesian communities. Keywords: Psychological Preparedness, Indonesia, disaster psychology

Parallel Session 5

14.30 - 15.45 WIB

Track 4 :
Disaster Society, Culture and History

Room 3 (D-304) Group 4-D

Moderator:
Ms. Yuli Arinta Dewi

Psychological Preparedness for Disaster in Persons with Disabilities

Umi Lathifah, Pradytia Putri Pertiwi

Abstract

Individuals with disabilities are a vulnerable group who are at high risk during disasters due to differences in their abilities and limitations in accessing resources in society. Physical limitations, lack of mobility assistance, and inadequate support often lead to individuals with disabilities lacking first aid, evacuation services, accessibility to public facilities, water and sanitation, and other services during disasters. Previous research has found that psychological preparedness can reduce the long-term psychological impacts of disasters. Individuals need to be psychologically prepared to effectively manage disaster situations or their aftermath. However, there has been limited research on the psychological preparedness for disasters among individuals with disabilities. This study aims to explore the profile of psychological preparedness for disasters among individuals with disabilities. It is a qualitative descriptive study that uses focus group discussions, interviews, and observations for data collection. The study includes 6 participants with disabilities living in Yogyakarta, aged adults, and at 3 levels of psychological preparedness (low, moderate, and high) determined through field testing of the PREPARED (Psychological Preparedness of At-Risk Indonesian Communities to Disaster) instrument. The data will be analyzed thematically to identify emerging themes and patterns, and the researchers will draw conclusions based on the findings. This study is expected to provide recommendations for decision-makers to identify appropriate actions for reducing disaster risk, and it can also serve as a reference for developing knowledge in similar areas.

Psychological Adjustment, Psychosocial Support and Collaborative Leadership Among Disaster Workers After The Cianjur Earthquake During Pandemic Covid-19: Indonesian Red Cross Case Study

Yuli Arinta Dewi, Cahyo Seftyono, Koentjoro Soeparno, Leo Pattiasina

Abstract

This study examines the psychological adjustment of disaster workers with differences in stress management training capacity associated with psychosocial support and collaborative leadership during earthquake emergency response operations in Cianjur, West Java on 21 November 2022. With the mixed method, we recruited Indonesian Red Cross staff and volunteers assigned as disaster response team after the earthquake. Data collection involved 59 disaster workers by accidental sampling. The level of perceived stress, anxiety and depression and professional quality of life were measured and psychosocial support and collaborative leadership were observed. Most of the respondents (79.7%) had never received stress management training for disaster workers before being assigned to the Cianjur earthquake. Higher levels of stress and burnout and lower levels of compassion satisfaction were detected in untrained disaster workers. There are significant differences of perceived stress, depression and burnout between trained disaster worker and untrained disaster on stress management. No differences for other variable (Anxiety, Secondary Traumatic Stress, Compassion Satisfaction). This research showed volunteers who received the briefing generally felt happier (2.07 points), happy to be disaster helpers (1.82 points), and happy to be able to help people in disaster areas (1.86). On the other hand, volunteers who communicate intensely with friends and family can relatively control stress and be happy (2.27 points) for those who still communicate with family and for those who interact intensely with fellow volunteers (2.06). The overall findings suggest that the mental health of disaster workers deployed in natural disasters during the Covid-19 pandemic requires further consideration with stress management training to be considered as a prevention program. On the other hand, it was found that the importance of friends/ peer support and family support for disaster workers in handling the double disaster.

School memorials as “Lieux de Mémoire” after the Great East Japan Earthquake

Julia Gerster, Akihiro Shibayama

Abstract

After the 2011 Great East Japan Earthquake, tsunami, and nuclear disaster, hundreds of so-called “disaster memorial facilities” have been newly built or actively preserved (Densho Road 2023). A particular category of such facilities is disaster heritage (shinsai ikō), which describes ruins of buildings that show traces of disaster – in most cases, those of an earthquake or tsunami. The most famous examples of disaster heritage sites may be the red dented frame of the Minamisanriku Disaster Prevention Center or the “miracle pine” in Rikuzentakata– the only pine that survived the 2011 tsunami out of 70.000 trees, later died due to the salt water and then preserved as a monument including replica elements. Yet, the vast majority of official disaster heritage sites are school ruins. At the time of this research, eight schools have been preserved as memorials and reopened to the public as disaster heritage sites in the prefectures most severely affected by the 2011 disasters, among them one school in Iwate Prefecture, five official and one unofficial site in Miyagi Prefecture, and one in Fukushima Prefecture. Although Japan’s disaster memorial facilities play a significant role in disaster education and may hold important insights for disaster memory transmission in other countries as well, disaster heritage sites have not gained much attention in English literature yet. In this presentation, the authors explore why so many schools have been preserved as disaster heritage sites and their relevance not only as a tool in disaster education but also as lieux de Mémoire; namely physical places or objects that function as a container of memory (Nora 1989). Comparing examples of disaster memorials and buildings that were not preserved, the authors will first discuss practical reasons for preserving school memorials, such as solid building structures, the number of deaths occurring at these sites, and consent from affected communities. Further, the authors will discuss the reason for the difference in number of preserved schools in the prefectures. Drawing from ethnological field research methods, the presentation will examine the schools’ role as lieux de Mémoire. As our research reveals, schools not only play an essential role in disaster education and as emergency shelters ever since the 1923 Great Kanto Earthquake (Borland 2022), but they are a hub of shared memories and symbols of communities even without a disaster. Residents remember how they, relatives, or friends spent time at these schools, and these memories, in turn, connect to overall experiences in a community. Moreover, elementary schools represent a place almost everybody in Japan has experienced. Unlike other disaster heritage sites, schools are therefore more ambiguous, leaving room not only for negative memories of disaster but also positive memories of times spent with friends or community members. Therefore, school heritage sites may make it easier for visitors as well to empathize with disaster victims and survivors, imagine the disaster, and understand the need for enhanced disaster preparedness. We hope that these insights will be helpful in the selection of disaster heritage sites in Japan and elsewhere.

Parallel Session 5

14.30 - 15.45 WIB

Track 5 :
Human Security, Pandemic, and Communicable Disease

Room 4 (D-402) Group 5-A

Moderator:
Ms. Fega Pangestika

The Role of Coping Strategy towards the Resilience of Health Workers during COVID-19 Pandemic at Meuraxa Hospital Banda Aceh

Chayank Ichwati Aulia, Marty Mawarpury, Mudatsir Mudatsir

Abstract

This study aimed to figure out the level of coping strategies and resilience for health workers in dealing with COVID-19 and to examine the role of coping strategies for the resilience of health workers in hospital. This study used the Brief COPE questionnaire for the coping strategy variable with Cronbach's alpha of 0,888 and the Connor-Davidson Resilience Scale (CD-RISC) for resilience with Cronbach's alpha of 0,89. 86 health workers participated in this study. The analysis of this study was univariate and simple regression. As a result, it showed that the level of coping strategy of health workers was 54 % low, 32 % medium and 14 % others were high. While the resilience of health workers was known as much as 19 % low, 65 % medium, and 16 % left are high. Thus, there is a significant relationship between coping strategy variables towards resilience with a correlation coefficient of 0.988. From the results of this study, it can be concluded that the highest level of coping strategies is at a low level and the highest level of resilience is at a medium level, then coping strategies affect resilience, so there is a need for support for health workers so they can improve their coping strategies and resilience when a pandemic occurs.

A Study of Longitudinal distress and support for the evacuees after the Great East Japan Earthquake: focusing on Sakata City, Yamagata Prefecture

Junko Okuyama, Shuji Seto, Tomonori Motokawa, Tomomi Kato, Satoru Ebihara, Fumihiko Imamura

Abstract

In Japan, local government officials play a central role in post-disaster community reconstruction. However, few studies have reported on the actual situation of municipal employees who hosted disaster victims far from the disaster area. We conducted a psychological improvement empirical study using interviews and an application for Sakata city employees who accepted disaster victims from the vicinity of the Fukushima Daiichi Nuclear Power Plant after the Great East Japan Earthquake. Interviews were conducted with three employees and analysed using the Trajectory Equifinality Model (TEM). As a result it was found that immediately after the disaster, there were many people who were eligible for support, and support was provided to groups such as by holding social events and salons, but as time passed, the number of eligible people decreased and aged, and it became clear that individualized support was required. In addition, an empirical study on the improvement of psychological conditions by the smartphone application for 39 staff members revealed that the percentage of insomnia according to the Athens Insomnia Scale score improved, and depressive symptoms, anxiety symptoms, and stress according to the Depression, Anxiety, Stress (DASS)-21 showed a tendency to improve. Coherence was also improved in job satisfaction. Therefore, it is suggested that public officials in remote areas from the disaster area have been supporting disaster victims for a long time after the disaster by changing their support methods, and that their psychological condition may be improved by using the smartphone application.

Resilience and Mental Health Status as a “Working Mom” Dealing with Changing Situations in Pandemic COVID-19

Sarita Candra Merida, Ditta Febrieta, Yulia Fitriani

Abstract

During the covid 19 pandemic, many changes in the situation faced by individuals. Especially, regarding the role of a mother. For “working mom”, changes in the situation also affect the psychological conditions such as stress, anxiety, trauma, mood disorders and even depression. Therefore, a mother needs to have of resilience so that she can carry out her role safely in dealing with changing situations. The purpose this study to describe the resilience of a mother facing various changing situations. The method used for this research uses literature studies. Literature search using google schoolar, dimensions and research gate with the keyword "resilience in working mothers". This research found that mothers need resilience to be able to deal with various situations specifically before, during and after a pandemic. A mother who has resilience will be able to adapt with various situations, has problem soving and more resilient. Of course, this resilience ability is influenced by internal and external factors. Internal factors include coping strategies, emotional intelligence, religiosity, self-esteem, and self-efficacy. External factors are social support from friends, work environment, partners and other family members.

Keywords : Pandemic Covid 19, Resilience, “Working Mom”

The Evaluation of COVID-19 Patients Mortality Rate in 2021 at Zainal Abidin General Hospital Banda Aceh

Meilya Silvalila, Siswani Sari, Nurul Huzaifi

Abstract

COVID-19 has been a global health emergency around the world since 2019. At the local level, this pandemic causes death and has led to an increase in the number of deaths in hospitals. This study aims to determine the mortality rate and characteristics of patients who died at dr. Zainoel Abidin (RSUDZA) General Hospital due to COVID-19 in 2021 at special COVID-19 ward RSUDZA (PINERE). The mortality rate is essential in handling COVID-19 in hospitals and assessing the quality of hospital care as part of the surveillance and evaluation process. Furthermore, this information can reduce the mortality rate of PINERE ward RSUDZA in the future. This quantitative research was conducted at RSUDZA in January-December 2021 by processing data on registered COVID patients who died in 2021. Of the 1938 patients who came for treatment with COVID-19 symptoms at RSUDZA from January to December 2021, the number of COVID patients who died was 588 (30,34%), while male patients showed a more significant number (54,4%). Most COVID patients who died were over 60 years old (43,4%). The result also showed that most COVID patients who died had no comorbidities (58,3%), followed by COVID patients with diabetes comorbid at 8,5%, and diabetes and hypertension combined comorbid are 5,4%. Meanwhile, based on the length of hospital stay, 12,9% of COVID patients died on the same day, but most died after one week of treatment (58,5%).

Parallel Session 5

14.30 - 15.45

Track 5 :
Human Security, Pandemic, and Communicable Disease

Room 5 (D-403) Group 5-B

Moderator:
Ms. Intan Dewi Kumala

Regional characterization of the psychological impact of the prolonged COVID-19 pandemic

Junko Okuyama, Shuji Seto, Yu Fukuda, Kiyoshi Ito, Fumihiko Imamura

Abstract

Mental health deterioration due to the COVID-19 pandemic is a worldwide problem. Young age, female age, economic problems, and complications of respiratory disease have been pointed out as risk factors for mental health deterioration. However, most of the studies reported to date have focused on individual factors, and there have been few studies examining the characteristics of residential areas and mental health deterioration during the COVID-19 pandemic. The purpose of this study is to propose prevention methods that consider regional characteristics by examining the human population flow in areas with particularly high infection rates. METHODS: A web-based survey was conducted in various regions of Japan on six occasions with a total of 1,000 participants. The survey period was June 25, 2020, for the first survey and August 31, 2022, for the sixth. The DASS (Depression, Anxiety, Stress Scale) 21 Japanese version was used to examine psychological status. The LSNS-6 (Lubben Social Network Scale short version) was used for prefectures with high and low infection rates to examine human connections and the flow of people around train stations in prefectural capitals. RESULTS: The psychological state was worst during the second survey (September 25-26, 2020, corresponding to the peak-out of the second wave) and normalized thereafter. The relationship between the psychological survey and the residents of each prefecture was examined by examining human flow data around major train stations in Iwate Prefecture, which had the smallest number of infected persons per million population at the time of the second and sixth surveys, and Tokyo, which had the largest number of infected persons per million population at the time of the sixth survey. In Japan, residents in areas with low population density and accessibility have been reported to have high depressive tendencies and high suicide rates, but under the COVID-19 pandemic, the psychological state was shown to deteriorate in areas with high human traffic, contrary to the previous findings. This study was reviewed and approved by the Ethics Committee of the International Research Institute of Disaster Science, Tohoku University. CONCLUSIONS: Previous studies have shown the effectiveness of increasing accessibility and strengthening human connections to reduce the suicide rate in the community. However, in an infectious disease epidemic such as the COVID-19 pandemic that was the subject of this study, it became clear that psychiatric symptoms may be exacerbated by high levels of accessibility. The results of this study indicate that new ways of connecting people in Japan are needed to prevent the spread of influenza, monkeypox, and other new infectious diseases in the future.

Urban Community Participation in Dealing with the Covid-19 Pandemic Through Environment-Based on Covid-19 Handling Policies in the City of Mataram

Diki Wahyudi, Sri Rum Giyarsih, Dina Ruslanjari

Abstract

The city of Mataram is an area that has a high number of Covid-19 cases in West Nusa Tenggara Province. Covid-19 has seriously impacted all aspects of life, from health, economy, society, culture, and tourism to religious rituals. This study aims to analyze the policies for handling Covid-19 in Mataram City. Second, analyze the form of community participation in efforts to deal with Covid-19 in Mataram City. This study uses the participation theory of Cohen and Uphoff as an analytical tool. This research is qualitative research with a descriptive approach. Indepth interviews, observation, and documentation employed data collection techniques. The results of this study indicate that this environment-based policy for handling Covid-19 effectively suppresses the spread of Covid-19 in Mataram City. This policy is implemented by involving the participation of all elements of government, local leaders, and the community. Community participation in handling Covid-19 starts with high public awareness of Covid-19, then implementing health protocols. Community participation is also seen in the formulation of policies for handling Covid-19, the movement to join a Task Force (Satgas), carrying out selfhelp movements to help each other, and being involved in evaluating the handling of Covid-19 in the City of Mataram. Keywords: Covid-19, community participation, policy,

Conspiracy Beliefs and COVID-19 Vaccine Hesitancy among Acehnese People

Luthfi Rahman, Intan Dewi Kumala, Arum Sulistiyani, Afriani

Abstract

Believing in conspiracy theories often serves as a coping mechanism to alleviate uncertainty and regain a sense of control during crises like the Covid-19 pandemic. However, the proliferation of conspiracy beliefs during this pandemic has led to adverse consequences, including an upsurge in Covid-19 vaccine hesitancy. This study aims to examine the relationship between conspiracy beliefs and Covid-19 vaccine hesitancy among the Acehnese populace. Employing a quantitative approach with the correlation method, this research selected Banda Aceh, Aceh Besar, and Sabang through one-stage cluster sampling. A total of 396 adult respondents registered for the Covid-19 vaccine in Aceh participated. The study employed modified versions of the Adolescent Conspiracy Beliefs Questionnaire (ACBQ) and the Adult Vaccine Hesitancy Scale (AVHS) instruments. The findings, revealed through Pearson correlation analysis, unveiled a significant link between conspiracy beliefs and vaccine hesitancy ($p = 0.000$, $r = 0.411$). This indicates that higher conspiracy beliefs correspond with elevated levels of Covid-19 vaccine hesitancy among the Acehnese population. In essence, conspiracy beliefs play a pivotal role in shaping vaccine hesitancy behaviors within the Acehnese community. The implications of this research underscore the necessity for enhanced educational endeavors, transparent communication, and vigilant monitoring of social media content to heighten public awareness and engagement in government-sponsored vaccination initiatives.

How People Seek Health Information during Disasters

Rizanna Rosemary, Alfi Rahman, Marini Koto, Fadhia Sahlaa

Abstract

People's knowledge and attitudes toward their health experiences can be traced back to how they search for information. Adequate health information is not just about the content or delivery methods; it also depends on the specific target audience. Seeking health information helps individuals and communities prevent health issues and make informed decisions about their well-being, including reducing risks. Information-seeking involves searching for content and the appropriate media for information dissemination. Despite the ease of obtaining health information in the digital era, individuals and communities are inundated with excessive information on health-related issues, making them vulnerable to false or hoax information. During disasters in Indonesia, health information often receives inadequate attention. The media's role in disaster situations primarily involves reporting on conditions, highlighting the need for comprehensive Disaster Risk Communication (DRC) that includes information on preventing health issues and reducing risks. DRC aims to promote appropriate protective behaviour among those receiving disaster risk information, necessitating understanding people's information-seeking behaviour. Existing studies on health information in the context of disasters primarily focus on establishing health information systems for disaster management. In contrast, disaster mitigation efforts mainly concentrate on physical facilities and infrastructure preparedness. Recent Systematic Literature Review (SLR) research indicates the need for improved psychological preparedness literature, particularly for at-risk groups. Since no previous study on health information-seeking in the context of Indonesia and disaster settings was found, this study aims to address the existing gaps. The survey questionnaire will be developed based on Longo's Health Information-Seeking Model. The content validity of the questionnaire was assessed by three subject experts—one from disaster mitigation and two from health communication and DRC. The survey will be distributed in six study settings: Banda Aceh, Aceh Besar, Aceh Utara, Aceh Tamiang, Aceh Tengah, and Aceh Barat. Using purposive sampling, 50 participants in each location will complete a self-administered questionnaire with trained enumerators responsible for distributing the questionnaires to the 300 respondents. Descriptive statistics and one-way analysis of variance (ANOVA) will be used to understand how people's health information-seeking behaviour affects health outcomes in the context of disasters. Findings suggest that health communication or information is sometimes intentionally sought and can have significant consequences, likely differing between active and passive information seeking. Enhancing people's health information-seeking behaviour can improve DRC by engaging multi-sector agencies, particularly health professionals and the media, in developing necessary health messages to benefit individuals in disaster contexts.

Parallel Session 6

15.45 - 17.00

Track 4 :
Disaster Society, Culture and History

Room 1 (D-302) Group 4-E

Moderator:
Ms. Nevi Kurnia

Participation of Persons with Disabilities in the Disaster Preparedness Program in Kepuharjo Village

Arni Surwanti, Tutik Purwaningsih

Abstract

Persons with disabilities face a higher risk during disasters. Socio-economic and physical vulnerabilities make them more vulnerable to disasters. Unfortunately, persons with disabilities tend to be overlooked in emergency preparedness systems . This causes persons with disabilities lack of understanding of disasters and how to overcome them. This community service program is carried out in Kepuharjo Village, a village prone to the "Merapi" volcano disaster. The programs implemented ensure that persons with disabilities are subjects in disaster preparedness. Activities are carried out by making innovations by realizing the management information systems, disability data and village disability groups; strengthening village governments and disaster resilient village teams, persons with disabilities to obtain information and knowledge about disasters; there is standard operating evacuation and rescue procedure, advocacy for availability accessible refugee barracks; and policy and budgeting that provide protection to persons with disabilities, and prepare sister village in the disaster preparedness program that is inclusive of the disability. Keywords: information system, disaster mitigation, persons with disabilities

Determinants of Helping Behaviour as a Psychosocial Aspect of Disaster in Disaster Prone Areas

Nevi Kurnia Arianti , Koentjoro, Baiquni Muhammad

Abstract

The helping behavior of community-based disaster volunteers in disaster-prone areas is important, as these volunteers are the frontline of successful disaster risk reduction programs. Understanding the helping behavior of volunteers will streamline the provision of psychosocial support. The endogenous variables in this study are altruism and egoism helping behavior. The exogenous variables are personal norms, social norms level of dependency, and duration of volunteering. This study aims to test whether the proposed model of volunteer helping behavior is acceptable. A quantitative study using survey method was conducted to answer the research questions. Respondents were 292 community-based volunteers in Yogyakarta Special Region Province aged between 20-61 years old. Data analysis used covariance based structural equation modeling (CB-SEM). The estimator used is maximum likelihood robust (MLR) to overcome abnormal data. The model accuracy index shows that the model fits the data. The results of the analysis show that altruism helping behavior is influenced by personal norms and dependency level, and egoism helping behavior is influenced by social norms and dependency level. Implications of the research results: Volunteer capacity building needs to pay attention to strengthening personal values, social values, and situations that allow for help such as knowledge, skills, and standardized physical equipment.
Keywords: helping behavior, community-based disaster volunteers, disaster-prone areas, psychosocial support

Local Resources as Fundamental Potential for Post-Disaster Community Recovery (A Case Study in Cugenang Sub-district, Cianjur Regency, West Java)

Danni Rossa, Izul Islam

Abstract

An earthquake in Cianjur Regency, West Java in November 2022, caused by fault movements in the Cugenang area, resulted in loss of life and damage to a number of public buildings, residential houses, and inadequate sanitation facilities. Limited communication and transportation access led to an increase in the cost of building materials, hindering the recovery process at the community level. There is a notion that alternative post-disaster recovery efforts could possibly be carried out by utilizing local resources in the affected area. The objective of this activity is to observe the influence of local resources in post-disaster recovery at the community level. The spirit of mutual cooperation and community kinship in Cugenang has enabled the community to recover independently without relying on assistance from external parties, especially in fulfilling the needs of education, play spaces for children, and sanitation facilities for the community. Communication to gather information was conducted through discussions with the community and local stakeholders, resulting in agreements and decisions ranging from resource identification to the implementation of construction work. Furthermore, it was confirmed that the Cugenang Sub-district possesses local resources that strongly support self-reliant disaster recovery. The identified local resources include building materials such as bamboo, and the communal tradition of "ngaliweut" has become a localwisdom. A participatory approach towards the community in the Cugenang sub-district was considered appropriate, leading to the realization of a temporary learning spaces and communal toilets with an ecoarchitecture concept. Although the resulting structures are temporary, earthquake-resistant construction standards are still applied. High community participation strengthens the conclusion that local resources, including bamboo, wood, and a culture of mutual cooperation, are highly effective in the post-disaster recovery process at the community level during the post-disaster phase. Keywords: participatory, recovery, local resources, resilience, bamboo, earthquake

Parallel Session 6

15.45 - 17.00

Track 4 :
Disaster Society, Culture and History

Room 2 (D-404) Group 4-F

Moderator:
Ms. Masnaeni Ahmad

The Role of Acehnese Women in Enhancing Community Preparedness through the Inter-generational Transmission of Local and Indigenous Knowledge

Raudhatul Khaira, M. Faris Abulkhair, Muhammad Fathin Kurnia, Rizqiya Safira, Rina Suryani Oktari

Abstract

Intergenerational transmission of traditional knowledge plays an important role. The involvement of women shows a significant impact on building family and community preparedness. However, limited attention paid to the unique contributions of Acehnese women has identified an erosion of traditional knowledge systems in the local context. This study explores the role and involvement of Acehnese women in the intergenerational transmission of knowledge about disaster preparedness based on local wisdom. A qualitative study in Banda Aceh and Aceh Besar involving interviews with key informants namely where they live, victims or non-victims of the 2004 Aceh tsunami, and career women or housewives. Acehnese ethnic women living in coastal areas were sampled randomly and purposively. Ten agreed to participate and were interviewed. The face-to-face interviews were recorded, transcribed, and analyzed using an analytical framework. The interviews revealed that the role and involvement of women in the transmission of local knowledge and practices was hampered by cultural and political factors which caused the erosion of this knowledge.

The Great Hanshin-Awaji Earthquake (1995) and the Self-Defense Forces (SDF): Changing Perceptions of the SDF in Local Communities

Masato Nakahara

Abstract

Abstract This research clarifies how the Japan Self-Defense Forces (JSDF) integrated into local communities after the Great Hanshin-Awaji Earthquake of January 17, 1995. In Japan's post-war pacifist mood, the JSDF had been regarded as a "social outcast" and marginalized by local communities for a long time. In the Great Hanshin-Awaji Earthquake that occurred under such circumstances, cooperation between the JSDF and local governments did not function well. Learning from the earthquake, local governments recognized the need to strengthen daily cooperation with the JSDF through disaster drills. Moreover, local governments that sought the cooperation of the JSDF in disaster drills felt indebted to the JSDF for its cooperation and began to cooperate in recruiting JSDF personnel. Furthermore, these partnerships became stronger with local governments beginning to invite the JSDF to local festivals. As a result, the JSDF became more integrated into local communities. The above findings indicate that the Great Hanshin-Awaji Earthquake became an important turning point in the process of the JSDF being integrated into local communities. Indeed, this change in local communities implies that a social base was formed that would later lead to the "SDF boom" in the wake of the Great East Japan Earthquake of March 11, 2011. Keywords: Japan Self-Defense Forces (JSDF), Great Hanshin-Awaji Earthquake, Perceptions of the JSDF, Anti-JSDF culture, Local communities.

It's Not What You Know, It's Who and How You Know That Matter Most?

Andrew Powell, Sneha Krishnan

Abstract

How do localised responses work in mass displacement settings to achieve health resilience and long-term recovery? This research reflects on the narrative analysis of research on humanitarian health, shelter and environment interventions in Cox's Bazar, Bangladesh at the onset of the covid pandemic 2020. This research investigates how localised environmental hazard responses work in conditions of uncertainty, focusing on the 'how', and 'who's' rather than 'what' disaster risk reduction narratives lead to action? This study focuses on how local actors in mass displacement settings reproduce knowledge in the case of health emergencies investigated through narrative analysis of research on humanitarian adaptive capabilities interventions in Cox's Bazar, Bangladesh. Using the case study of Rohingya refugees we investigated using narrative analysis how faith-based leaders acted as focal points for knowledge-sharing, meaning-making and transferring knowledge

Content Validity of Collective Efficacy Questionnaire for Natural Disasters Based on Aceh Local Wisdom

Keumala Hayati, Andi Ulfa Tenri Pada, and Marty Mawarpury

Abstract

Disaster preparedness is one of the efforts to reduce the impact of disasters. This preparedness is very important for people who directly feel the disaster and the impact of the disaster itself. Preparedness behavior in this community can be influenced by collective efficacy, namely the ability of community members to work together and take action in dealing with disasters. For this reason, it is necessary to develop an instrument that can measure collective efficacy in the context of disaster. This research focuses on developing instruments that can measure the collective efficacy of communities in the context of natural disasters based on local wisdom adapted to the local culture of Aceh. Collective efficacy instruments were developed and content validity was tested. This article describes the procedure for calculating content validity coefficients. The purpose of this study was to conduct content validity of the collective efficacy instrument in the context of natural disasters based on local wisdom in Aceh. Content validity refers to the extent to which the instrument covers the content that is supposed to be measured. Content validity was assessed using a five-point Likert scale then analyzed using Aiken's V formula to obtain the content validity coefficient. Item analysis was carried out by 7 experts in the fields of psychometrics, social, and disaster who assessed content representation based on construction, relevance, and clarity. As a result, of the 47 items that were validated, there were 7 items did not meet the valid requirements because the content validity coefficient was below 0.75.

Parallel Session 6

15.45 - 17.00

Track 6 :
Disaster Governance and Diplomacy

Room 3 (D-304) Group 6-A

Moderator:
Dr. Mizan Bisri

Regional Cooperation on Disaster Risk Management through ASEAN, ASEAN+3, and the TCS: snapshot and prospects

Mizan Bustanul Fuady Bisri

Abstract

This paper explores the current state, untapped opportunities, and potential of regional cooperation for disaster risk management (DRM) through selected regional mechanisms in Northeast and Southeast Asia, namely the Association of Southeast Asian Nations (ASEAN) and their cooperation with the Plus Three Countries or three Dialogue Partners from East Asia (China, Japan, and South Korea) vis-à-vis the ASEAN+3 and the Trilateral Cooperation Secretariat (TCS) belonging the Plus Three Countries. These 13 countries shared multi-faceted risks, including but not limited to risks from natural hazards, climate change, public health emergencies, aging population and infrastructure, financial risks, and traditional and non-traditional security risks. ASEAN regional projects still rely upon from contribution of the Plus Three Countries amidst growing internal forces and from other ASEAN partners. In the meantime, the Plus Three Countries' public and private investment in Southeast Asia also relies on political security, and economic and social stability amidst various risk drivers of the region. Amidst this background, the paper question to what extent and whether regional cooperation projects through those mechanisms have complementary effects from one to another to enhance regional disaster resilience measured against relevant regional policy initiatives, including AADMER Work Programme implementation and strategic plans within ASEAN+3 and the TCS. The paper investigates selected regional cooperation initiatives in ASEAN, ASEAN+3, and the TCS, respectively, against the lense of Splander's Four Narrative (2020), Cook's humanitarian diplomacy, as well as ideas of ASEAN centrality (see Bisri et al 2019, among others). The initiatives assessed include ASEAN-related projects funded/supported by Japan, China, and South Korea, respectively; ASEAN+3 initiatives on emergency rice reserve and Southeast Asia Disaster Risk Insurance Facility; as well as activities of the TCS. The data of the paper is derived from publicly available documents and key informant interviews. Our initial findings suggest that the difference in the origin of regional cooperation for disaster risk management in each mechanism affects the potential of cross-regional complementary effects. In ASEAN, cooperation on DRM falls under the socio-cultural pillar, while in ASEAN+3, the initiatives have more economically motivated goals, and in the TCS, disaster prevention and management are constrained to political affairs. Another factor that prohibits the cross-fertilization of ideas between the three is the different nature of resource mobilization of each of them. Accordingly, even though the ASEAN+3 mechanism exists, the Plus Three Countries still prefer bilateral engagements either through ASEAN, the AHA Centre, or directly to each ASEAN Member States government. Furthermore, it seems that both ASEAN and TCS officers are not fully aware of the potential of the two regional cooperation prospects in DRM. In conclusion, the paper outlined several future regional challenges where closer working relations through ASEAN, ASEAN+3, and the TCS could benefit the people from these thirteen countries, achievement of SFDRR targets, and relevant SDGs. Keywords: Regional cooperation, ASEAN, ASEAN+3, Trilateral Cooperation Secretariat (TCS)

The Influence of Natural Disaster Regional Information on Investment Flows in Aceh

Dianlopa Kamata, Taqwaddin, Iskandarsyah

Abstract

This research explores the impact of information on disaster areas on Foreign Direct Investment (FDI) in Aceh. This study aims to explain the relationship between information on disaster areas and FDI decisions to increase understanding of the factors influencing investment opportunities in Aceh. This study used qualitative methods to examine the relationship between information on disaster-prone areas and foreign investment. Qualitative analysis involves the relationship between the provision of information on disaster areas and the level of foreign investment in Aceh. Preliminary results indicate that the availability and accuracy of information on disaster areas has a major impact on foreign investors' risk perceptions and evaluations. Provision of timely and transparent information on disaster risks, mitigation measures, and government response strategies was observed to have a positive impact on investor confidence. Conversely, limited access to reliable information or perceptions of inadequate disaster preparedness may discourage potential investors from engaging in investment activities. The results showed that the level of information on disaster areas in Aceh was not satisfactory and tended to affect the level of investment in Aceh Province. Aceh has very limited resources and information compared to other provinces. The level of investment in Aceh is also not very high compared to other provinces which have also experienced major disasters. It is necessary to increase the provision of information on disaster areas and the integration between the disaster management office and the investment service also needs to be improved.

Improving Risk Financing Strategies in Indonesia through Cianjur Earthquake Insights

Felix Wisnu Handoyo, Syarifah Aini Dalimunthe, Purwanto, Ikval Suardi, Chitra Indah Yuliana, Erla Mychelisda,
Irwanda Wisnu Wardhana, Agus Eko Nugroho

Abstract

Earthquakes are a growing threat to Indonesia, with limited resources for risk mitigation. The current reliance on government relief is unsustainable. Despite Law No. 24/2007 on Disaster Management, inclusive disaster risk financing schemes have yet to be established. This study aims to provide evidence for disaster risk financing strategies in Indonesia, focusing on geological disasters in active fault areas with high population density. Aligned with the Sendai Framework for Disaster Risk Reduction (SFDRR) Priority 2, this study seeks to address the financial impact of disasters on governments and societies. By analyzing responses to risk financing following the November 21, 2022 earthquake in Cianjur Regency, this study examines emotional reactions, risk perceptions, and willingness to participate in risk insurance. The findings highlight low participation in insurance programs due to limited insurance literacy and low enrollment in micro earthquake insurance. Material losses from the Cianjur earthquake impose a significant financial burden on the government. There is a critical need for disaster insurance schemes, especially for homes and fixed assets at high risk of land loss due to landslides. Willingness to participate varies among different socioeconomic backgrounds. This article emphasizes the urgency of implementing disaster risk financing in Indonesia, with a focus on the vulnerability of poor and low-income households.

Parallel Session 6

15.45 - 17.00

Track 6 :
Disaster Governance and Diplomacy

Room 4 (D-402) Group 6-B

Moderator:
Dr. Alex Robinson

Disasters Induced Damages and Economic Losses for Public Buildings in Indonesia: A Multi-hazard Approach

Syamsidik, Yunita Idris, Muksin Umar, Adriansyah, Muhammad Daffa Al Farizi, Aulia Khalqillah, Adrian Ulza

Abstract

The urgency of financial protection for any damages caused by disasters is eminent. This includes for hundred thousand public buildings in Indonesia situated in disaster-prone areas. However, a comprehensive financial protection is not available yet. One of the reasons is due to lack of financial mechanisms that provide sufficient support to do so. This research is aimed at providing figures of economic losses due to multi-hazards on public buildings in Indonesia. The research was conducted through number of numerical simulations and probabilistic analysis on earthquakes and tsunamis around Sumatra and Kalimantan, two main islands in Indonesia. Tsunami sources were taken from mega-thrust segments around the western coast of Sumatra and northern part of Sulawesi. Tsunami simulations were performed using Cornell Multi-Grid Coupled Tsunami model (COMCOT). Meanwhile, for earthquake, Global Earthquake Model (GEM) was applied to generate hundred thousand scenarios of earthquakes. Event-loss tables (ELTs) were employed to estimate damages and losses due to the earthquakes and tsunamis. Probable Maximum Losses (PML) and Annual Average Losses (AAL) on buildings were calculated. Here, the study assessed three types of buildings, namely health facilities, schools, and government offices. This study is considered the first ever study in Indonesia that considers large data of buildings coupled with hundred thousand earthquake sources/magnitudes, and tsunami simulations. The results are beneficial for composing strategies for financial and insurance strategies in Indonesia.

BPBD Institutional Reform in Realizing Inclusive Disaster Management in Indonesia

Satrio Amrullah, Arif Budiman Al Fariz, and Nabila Aulia Rahma

Abstract

Indonesia is a country with high disaster intensity. Among the people who became victims, there are vulnerable groups such as children, the elderly, people with disabilities and pregnant women who are affected materially and psychologically. The government through the Disaster Management Law has delegated BNPB at the central level and BPBD at the regional level to carry out disaster management mechanisms so that people feel safe, especially for vulnerable groups. But in reality, BPBD is not optimal in implementing inclusive disaster management programs. This is due to: physical and non-physical access is not evenly distributed in each region, the unavailability of inclusive disaster management mechanisms, so that the handling tends to be temporary and unsustainable, the maximum budget provided, and the available system is not inclusive. Thus, the formulation of the problem in this paper is: (1) How are the problems experienced by marginal/vulnerable groups in disaster management?; (2) What are the problems in the implementation of the duties and functions of BPBD in implementing inclusive disaster management?; (3) What is the ideal format for BPBD institutional arrangement to be able to overcome inclusive disaster management problems? This study aims to analyze the problems experienced by BPBD in realizing inclusive disaster management in Indonesia and formulate the ideal format of BPBD institutional structuring that is effective in overcoming these problems.

Measurement of Indicators of the Sendai Framework for Disaster Risk Reduction 2015-2030 at Local Level: A Case Study of Sendai City

Daisuke Sasaki, Yuta Hara, Yuichi Ono

Abstract

The year 2023 is the midpoint of the evaluation period of the Sendai Framework for Disaster Risk Reduction 2015-2030 (SFDRR). Central and local governments in each member state are supposed to conduct a midterm review of their efforts to achieve the goals of the SFDRR by means of its 38 indicators. There, however, seem to be quite few cases in which local governments have so far conducted such a midterm review in a proactive manner. Under such circumstances, the International Research Institute of Disaster Science (IRIDeS) at Tohoku University and the City of Sendai jointly measured the indicators of the SFDRR to examine the achievement of its goals for the time being. The objective of this study is to organize the issues and findings in the collaborative research in a way that can be applied in other regions. The authors first clarify challenges related to accessibility to input data that other local governments at home and abroad would face in the coming years. Subsequently, we advocate how local governments could utilize the indicators of the SFDRR to accelerate its social implementation at local level in an evidence-based manner.

How does the central government behave in the international arena of disaster risk reduction? Focusing on the frequency of statement publication at the UN Global Platform for Disaster Risk Reduction

Yuta Hara, Daisuke Sasaki, Yuichi Ono

Abstract

This study aims to clarify each member state's stance on disaster risk reduction (DRR) and the issues that need to be addressed in the international arena of DRR, to move forward with the implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030 (SFDRR). To this end, we focused on the previous last three UN meetings of the Global Platform for Disaster Risk Reduction (GPDRR) after the agreement on the SFDRR, and analyzed the frequency of the publication of official statements by each member state. In addition, the status of statements was analyzed in terms of the actual geographical distribution of disaster risk. We clarified the following points that (1) the international arena in DRR is not necessarily aware of the situation and opinions of all member states. (2) The trends between the frequency of statement publication and the actual amount of risk are not always of one accord. (3) The member states in the Asian and Pacific Ocean region were more active in presenting statements than those of other continents; in other words, the views of the Caribbean, Eastern Europe, and some African member states, which also have high disaster risks, were shared less frequently in the international arena. (4) Some least-developed countries are actively making statements and expressing their intentions despite the limited human and financial resources. The results of this study would be helpful for member states that have not yet made statements in the past GPDRR to advance their views and situations in the international arena.

Parallel Session 6

15.45 - 17.00

Track 6 :
Disaster Governance and Diplomacy

Room 5 (D-403) Group 6-C

Moderator:
Ms Fega Pangestika

The role of Functional Staff in mainstreaming disaster risk reduction and structuring disaster management systems in the regency/ municipality

Dadik raharja, Fitra Annurhutami, Galih Aries Swastanto

Abstract

The 4th point of the 7th Nawacita's the Republic of Indonesia Ir. Joko Widodo is trying to reform the bureaucracy structurally so that government institutions become simple and agile. Bureaucratic reform is carried out through structural transformation by simplifying the organizational structure of the government and transferring or equalizing positions. The transfer or equalization of structural positions into functional ones is expected to create a dynamic and professional bureaucracy to encourage effectiveness and support the performance of public services to realize the vision of Gold Indonesia. To speed up the process of transferring/equalizing positions, the appointment of ASN in functional positions, which initially could only be passed through the first appointment mechanism, transfer and adjustment/passing through Government Regulation (PP) No. 17 2020, the government added a promotion mechanism in the appointment of functional positions. There are two functional position options that ASN can choose in the BPBD neighborhood from the 228 nomenclature of available functional positions. However, the facts on the ground show that not many ASNs within the BPBD have participated in the transfer/equalization of positions. As a case study in the Kediri Regency BPBD neighborhood, out of nine ASN personnel, only one person took part in the equalization program for positions. As expected, the increase in the number of functional positions as the main composition in the bureaucratic structure is very far from what was expected. As part of the obligatory sub-affairs that the local government must carry out, disaster affairs oblige the regions to carry out essential services related to disaster-prone information services, disaster prevention and preparedness services, and rescue and evacuation services for disaster victims. The indicators for the implementation of these services include the preparation of the Disaster Risk Assessment document (KRB), the Disaster Management Plan document (RPB), the Emergency Disaster Respons Plan document (RPKB), and the Contingency Plan document for each type of disaster threat. Referring to BNPB 2023 data, out of 514 districts/cities in Indonesia, only 38.7% have KRB documents with active status, 21% of regions have RPB document status with functional status, and 67.9% do not yet have to renkon documents. BPBD Kediri district in the 2021 – 2022 period has succeeded in compiling KRB, RPB, and RPKB documents and is equipped with a RENKON for extreme weather disasters. Preliminary findings in this study indicate that functional position groups have a role in promoting the alignment of disaster management planning and budgeting. This paper uses a descriptive qualitative approach to describe the role of functional position groups in mainstreaming disaster risk reduction and structuring disaster management systems in regions with a case study in the Kediri Regency. It is hoped that the results of further identification from this paper can become the basis for accelerating the transfer/equalization of positions so that disaster mainstreaming in development planning can be carried out optimally.

Assessing the International Multi-Hazard Disaster Risk Governance in the Greater Mekong Sub-Region

Robby Cahyadi, Tiffany Salikha, Rufaida N. Vicri.

Abstract

The Mekong River Basin faces various compounding and interconnected hazard caused by climate risks and human development activities such as rapid hydropower dam construction that increase disaster risks in the region. For instance, slow onset climate events and the construction of hydropower dams may cause indirect disaster risks and adverse negative impacts to downstream countries such as changes in water flow patterns resulting in unpredictable flooding occurrences, water intrusion due to sedimentation accumulation, as well as potential technological disasters. A critical example is the dam failure of the Xe Pian Xe Namnoy in Lao PDR, which serves as a model thinking for governments across countries to consider their role in disaster governance. Given its multi-hazards and transboundary impacts, it is imperative to create effective, regional-level disaster risk governance across the Mekong Sub-Region's countries. There are several established cooperation frameworks in the region including the Mekong River Commission (MRC) and the Lancang-Mekong Cooperation (LMC) to name a few. The region predominantly involves six riparian countries of the Mekong Sub-Region (i.e. China, Myanmar, Thailand, Laos, Cambodia, and Vietnam). However, the strengths, weaknesses, and effectiveness of the regional platforms in governing disasters in the region remain to be understudied, especially in the context of addressing cascading, multihazard disaster risks in the Mekong River Basin. Hence, this paper aims to assess the regional capacity and effectiveness as a regional platform for addressing multihazard and transboundary disaster risks. This paper will utilize a qualitative research method, including desk review and content analysis of relevant literature and policies. For the analytical approach, the paper will also adopt the multihazard disaster risk governance concept to analyze the multihazard risks of the Mekong River Basin. The paper will also examine how the region employs soft-political collaboration through the International Regime theory. By incorporating perspectives of disaster risk governance and international cooperation issues in the Mekong region, this interdisciplinary study provides a unique and novel angle for the disaster risk reduction field. Findings from this study are also expected to contribute to achieving the Sendai Framework for Disaster Risk Reduction's Target F of enhancing international cooperation in disaster risk reduction. Additionally, this study also provides a new outlook on how multihazard disaster risk governance is implemented at the regional level to address the multiple facades of disaster risks in the region, including manmade hazards due to development activities, that can also transcend beyond the national borders of the Mekong River countries, calling for a more integrated and collective approach within the existing regional cooperation framework.

Evaluation of Disaster Risk Assessment Map as a Media for Communication, Education, and Information about Disaster Risk on Community in Gunungkidul Regency

Galih Aries Swastanto, Agus Wibawa Arifianto, Fitra Annurhutami

Abstract

The Government of Indonesia is committed to reducing disaster risk in its territory by implementing the Sendai Framework for Disaster Risk Reduction 2015–2030 and must be done by local government too. Three basic services must be provided by local governments about disaster affairs, one of which is disaster information with the main activity being the preparation of Disaster Risk Assessment Documents (KRB) and Communication, Information and Education (IEC) about hazard. The preparation of the KRB document is an obligation that must be carried out by the Local Government as the basis for preparing Disaster Management Plan Document (RPB) and IEC media. Outputs of the Disaster Risk Assessment is a hazard, vulnerability and risk map that can be used to show the condition to threats in an area. But referring Law 24/2007, the use of maps and disaster risk assessment are for their handling and integration into development planning. This study aims to evaluate the use of maps resulting from disaster risk studies as KIE media. The research method used is qualitative in the form of a case study in Gunungkidul Regency. The results show that the use of disaster risk assessment maps as IEC media is not suitable for conveying disaster information. Therefore, it is necessary to carry out a separate study related to disaster information that can be used as IEC media and adapted to the conditions of the local community.

Parallel Session 6

15.45 - 17.00

Track 3 :
Urban planning, reconstruction and recovery

Room 6 (D-404) Group 3-B

Moderator:
Dr. Aaron Opdyke

Enhancing Sustainability in Post-Disaster Recovery: Lessons From Flood Events in Aceh Tamiang Regency

Nur Ikhsani Rahmatika, Zahrani

Abstract

Flood is the most frequent disaster that occurs in Aceh Tamiang Distric. In November 2022, Flood that occurred in Aceh Tamiang caused thousand lost of life and damages to properties. Total loss consequence related to flood disaster in Aceh Tamiang District estimated reached 6 Billion Rupiah. Rehabilitation andReconstruction Process is an internal process of disaster management which needs the biggest cost compared to with another process. The magnitude costs incurred in rehabilitation and reconstruction should be in line with the principle of Build Back Better and Safer to minimize the risk of flood disaster. Rebuilding in post-disaster rehabilitation and reconstruction must also be based on disaster risk reduction because the cycle in disaster management is a continuous cycle so that the implementation of post-flood recovery must also concern on the principles of disaster prevention and mitigation. Continuous post-flood handling and flood mitigation need to be carried out so that disasters do not recur. Floods can be overcome with the right solution according to the characteristics of each region adapted to the conditions, environment and culture of the people in that area. Several regions in Indonesia have succeeded in dealing with flooding both through development and through educational and regulatory approaches to the community. Floods in several countries have also been managed well, one of them is in Japan. Success in handling this flood needs to be used as a reference in setting policies and in rebuilding after the floods in Aceh Tamiang. In addition, it also needs to be adapted so that it is relevant to the conditions in Aceh Tamiang Regency. This is Qualitative Study used Systematic Literature Review and Fenomenology as it’s metodologhy. This research is divided into several stages. The first stage is to conduct a literature review based on data related to the successful handling of floods in various regions in Indonesia and in other countries. The next stage is to conduct observations and interviews with related parties to find out the conditions in Aceh Tamiang District and Its Local wisdom then carry out a synthesis related to flood management that is relevant to be carried out in Aceh Tamiang in post-disaster Recovery. Much research has been done to study about floods in Aceh Tamiang District, however there is no research related to sustainable flood management strategies. Aceh Tamiang District also does not have RPB, KRB, Contingency Plans and Operational Plans documents for dealing with flood disasters. This research also focused on adapting the post-flood recovery concept to the conditions and local wisdom of the people in Aceh Tamiang District so that the results of this research can be used to formulate policy by the Government of Aceh Tamiang District.

Unveiling the rebuilding progress in the fifth year following the 2018 Central Sulawesi earthquake and tsunami

Kanako Iuchi, Yasuhito Jibiki, Nuraini Rahma Hanifa, Rahmadiyah Tria Gayathri, Dicky Pelupessy, Ayako Kusunoki, Hiroshi Takagi, Tamiyo Kondo, Robert Olshansky

Abstract

After a devastating disaster, the fifth year often becomes the moment to review recovery efforts. One of the reasons is that housing-related activities show a sign of completion (see Martin et al., 2021), and the other is that involved stakeholders realize their status in the minutia of implementation and thus desire to reposition their progress in a larger picture (see Iuchi & Olshansky, 2018). Reviewing recovery efforts in the fifth year following the 2018 Central Sulawesi earthquake and tsunami is essential because the outbreak of COVID-19 gave little attention to the recovery progress. This paper thus unpacks the rebuilding progress in the PASIGALA region and reviews how the rebuilding plan, especially on community relocation, has been implemented. The article also identifies essential features that need further attention to achieve the goal of rebuilding with equity. This paper uses data collected from late 2018 to March 2023 through in-depth document review and fieldwork activities. Among several other projects that evolved in the discourse of safe rebuilding, relocation of the affected residents was one of the most critical and controversial efforts. Unlike other cases in Asia (e.g., Tohoku after the GEJE and Tacloban after Typhoon Haiyan), the plan to relocate communities developed progressively; initially, PASIGALA's rebuilding master plan identified four permanent relocation sites (huntaps) to accommodate more than 6,100 units and began official construction in 2020 as the phase I of the national project. This plan, however, was unacceptable to many relocating residents due to its location and size. The idea of 'satellite' huntaps, funded by municipalities, then emerged to accommodate fishermen and farmers in nearby sites collectively to access their source of living. Later in mid-2020, Mandiri relocation became an option to accommodate families to a location of their preference. It began construction in January 2021 as Phase II of the national project. While limited in accommodating all residents' needs, governments saw the importance of support to rebuilding residents' lives. Meanwhile, recent 2023 fieldwork revealed several issues and opportunities. First, some local communities lost relocating options and continued living on the restricted original land. Their initial resistance to relocating resulted in them losing their space in the new huntaps. This issue is challenging to solve because the land of these families is unregistered with the modern land management system, which took place in the Agrarian reform in the 1960s "to provide a lawful security for the people with regard to agrarian rights (Soemardjan, 1962. pp. 25)" and accelerated in 2016 "to reduce poverty (Ismeti, 2021. pp. 89)." This point of dismissed rights to huntaps, enforced by governments with its intention to reduce future hazard risks, needs further exploration. Second, fieldwork showed a sign of residents' capacity to adapt – those who relocated to higher lands away from the coast established a public space similar to the one in pre-disaster living to enjoy outdoor activities at night with music. Also, in the coastal areas, public space is similarly restored. Such adaptability suggests further research needs on measuring satisfaction in new relocation sites. References Ismeti. (2021), Agrarian Reform at Sigi Regency of Central Sulawesi: Between Hope and Reality, Jurnal Notariil, 6(2). Iuchi, K., & Olshansky, R. B. (2018). Revisiting Tohoku's five-year recovery: Community rebuilding policies, programs and implementation. In V. Santiago-Fandino, S. Sato, N. Maki & K. Iuchi (Eds.), The 2011 Japan Earthquake and Tsunami: Reconstruction and Restoration Insights and Assessment after 5 years (pp. 91-111). Springer. Martin, C., Gilbert, B., Teles, D., Theodos, B., Daniels, R., Srini, T., DuBois, N., Brody, I., & Stacy, C. P. (2021). In Urban Institute (Ed.), Housing Recovery and CDBG-DR: A Review of the Timing and Factors Associated with Housing Activities in HUD's Community Development Block Grant for Disaster Recovery Program. Urban Institute. Soemardjan, S. (1962). Land reform in Indonesia. Asian Survey, 1(12), 23-30.

The Disruption of Household Livelihood Assets after Semeru Eruption in 2021

Mohamad Mambaus Suud, Sumarmi, I Komang Astina, Syamsul Bachri, and Anisatu Nadhiroh

Abstract

The lack of a defined mapping of disruption to household assets can lead to the neglect of necessities for families striving to recover from disasters. This study identified and mapped various forms of disruption to household livelihood assets resulting from the Semeru Volcano Eruption in 2021. A mixed-method approach was employed, utilizing an open-ended questionnaire and interviews for data collection. The data underwent descriptive statistics and Colaizzi analysis. A comprehensive map of household asset disruption caused by the Semeru Eruption, following the Pentagon asset model framework, has been developed, encompassing different aspects of household livelihood security (HLS). The disruptions include 1) disruptions to human assets, primarily affecting food assets, particularly their distribution; 2) disruptions to physical assets, resulting in the loss of housing; 3) disruptions to financial assets, characterized by the loss of valuable family assets and employment; 4) disruptions to social assets, specifically impacting spiritual activities; and 5) disruptions to natural assets, particularly the accessibility of clean water. This research also sheds light on the initial coping mechanisms employed by the affected community.

Keywords: Household asset disruption, Semeru volcano eruption, pentagon asset, household livelihood security

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