THE INTERNATIONAL CONFERENCE ON DISASTER MITIGATION AND MANAGEMENT (ICDMM) 2021

ICDMM 2021
Online/Virtual Conference

PROGRAM & ABSTRACT BOOK

Padang, West-Sumatra, Indonesia
September 30th - October 01st 2021
The committees have been trying to check the typos and the contents of this program book before going to the book printing process. If there were still errors and omissions, then the committee will fix it in the digital version of this book, which is stored on the website of the ICDMM 2021 event.
Preface

We all at Andalas University would like to welcome you to The International Conference on Disaster Mitigation and Management (ICDMM) 2021. We are delighted to meet you all during this Covid-19 pandemic. Many of our colleagues have been affected by Covid-19; hopefully, they can recover as soon as possible.

We have prepared this Program & Abstract Book to help participants join the conference. In this book, there are welcome remarks, a schedule for implementing the conference, presentation schedule, abstracts from the manuscripts, and others. There is also a zoom link to follow this online conference.

Thank you, I hope we have a pleasant conference experience.

Padang, September 30th, 2021

ICDMM 2021 Conference Committee
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WELCOMING REMARKS BY RECTOR OF ANDALAS UNIVERSITY

On behalf of the Andalas University, I am greatly honored and pleased to welcome you all to The “International Conference on Disaster Mitigation and Management” or ICDMM 2021 in Padang.

It has been twelve years since Padang and the surrounding areas were struck by the strong earthquake on the 30th of September 2009. We were devastated at that time. But ever since, we have tried to rebuild what have been damaged. As you can see, here we are now. There are still many things to do, but it is much better than before.

Around the world, many natural disasters have occurred and have caused many casualties and damages on the infrastructures and lifeline facilities. However, from the disasters, we have also learned and then developed a lot of advancements in science and technology as well as disaster mitigation and management to provide a better and safer environment for humanity to live. This conference provides the opportunity for sharing the most recent findings related to disaster management as well as disaster mitigation. It will bring together research in engineering, social, cultural, scientific or medical fields, which might be adopted in the disaster mitigation policy and action.

We have high expectations that this conference will come up with fruitful ideas to disseminate among us. Also, in this conference, we will share the knowledge, social, cultural, science and technologies, and management to safeguard humanity from any disasters in general, and to promote disaster mitigation for risk reduction efforts worldwide.

The ICDMM 2021 is initiated by Andalas University, especially by the Disaster Study Center of Andalas University, in collaboration with the Civil Engineering Department, Andalas University. Hereby, I would like to thank all the conference committee for organizing this important event.

In this conference, we have participants from eight countries, including Indonesia. The speakers come from Malaysia, India, Japan, United Kingdom, the Philippines, China, and USA. In total, 140 (one hundred and forty) papers will be presented in this ICDMM 2021.
I would like to extend my gratitude to all the speakers and participants in this ICDMM 2021. You are our distinguished guests. I would also like to extend my gratitude, especially to all of our keynote speakers and invited speakers.

Welcome to the ICDMM 2021 virtual conference.

We hope you will enjoy the conference.

Thank you very much,

Prof. Dr. Yuliandri
Rector of Andalas University
WELCOMING REMARKS BY CHAIRMAN OF THE ICDMM 2021

His Excellency Head of National Agency of Disaster Management of Indonesia, Bapak Letjen Ganip Warsito. The honorable the Governor of West Sumatera, Bapak Mahyeldi Ansyarullah. The honorable Rector of Andalas University, Prof. Dr. Yuliandri. Our distinguished guests, our Keynote and invited speakers, participants, Ladies and gentlemen.

On behalf of the organizing committee, I would like to welcome you all to the International Conference on Disaster Mitigation and Management (ICDMM 2021).

This conference is organized by the Disaster Study Center and Department of Civil Engineering, Andalas University, collaborating with the Indonesian Earthquake Engineering Association (AARGI) and the Indonesian Association of Disaster Experts (IABI). This conference is also dedicated to commemorating 12 years of the 2009's Sumatera Earthquake that took more than 1,000 casualties, injured many more, and destroyed and damaged many buildings and houses.

While there have been many encouraging signs of progress on disaster mitigation and management, they still pose huge global problems today. It is reflected in the enthusiasm we have received for this conference. We have more than 140 scientific papers that will be presented in the ICDMM 2021. All the papers related to disaster mitigation and management, including the Covid-19 outbreak, lessons learned from disaster management, enhancing framework for disaster, tsunami and seismic engineering, geotechnical engineering, structural engineering, transportation and logistics, water and resources engineering related to the disaster.

The conference will bring together leading researchers, engineers, architects, scientists, and other professionals in various disciplines of social science and engineering around the world related to disaster mitigation and management. We encourage you to participate in the discussions, and we hope the conference helps in the exchange of information and the development of new collaborations among all stakeholders.

In this conference, 9 keynote speakers will share their knowledge and experiences in the disaster management. Also, there are 15 invited
speakers will present their research and experience in this conference, with various topics on the natural and non-natural disaster management.

The ICDMM 2021 could not take place without the supports and assistance of many parties. On this occasion, I would like to sincerely thank the Rector of Andalas University, LPPM functionaries and staff, Keynote and invited speakers, and all members of the Organizing Committee. I would also like to thank the authors, reviewers, all speakers, session chairs, and sponsors for their support for ICDMM 2021.

Thank you for being here with us. We appreciate your presence at this conference. Enjoy the conference. We welcome you to an inspiring, educational, and enjoyable program.

Prof. Dr.Eng. Fauzan
Committee Chairman
Advisory Committees:

Prof. Dr. Yuliandri (Andalas University)
Dr.-Ing. Uyung Gatot S. Dinata (Andalas University)
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Prof. Junji Kyono (Kyoto University, Japan)
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Marlon Era, Ph.D (De La Salle University, Philippines)
Prof. Louise K. Comfort (University of Pittsburgh, USA)
Prof. I Wayan Sengara (Bandung Institute of Technology)
Prof. Margaret Caroll Bell (Newcastle University, UK)
Prof. Teuku Faisal Fathani (Gajah Mada University)
Harkunti Pertiwi R, Ph.D (Bandung Institute of Technology)

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Aulia Putri Yelisa (Andalas University)
Rezi Triani (Andalas University)
Rizki Satria Putra (Andalas University)
Faizah Ahmad (Andalas University)

**Reviewers:**

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Mas Mera, Ph.D (Andalas University)
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Dr. Badrul Mustafa Kemal (Andalas University)
Dr. Tesri Meidaliza (Andalas University)
Prof. Vera Surtia Bachtiar, Ph.D (Andalas University)
Prof. Dr. Eng. Zaidir (Andalas University)
Ahmad Junaidi, MT., M.Eng.Sc (Andalas University)
CONFERENCE SCHEDULE
# Schedule

**Thursday 30th September 2021**  
**09:00 – 16:00 Conference Day 1**  
(all times in Indonesia Western Time / GMT+7:00)

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<td>15</td>
<td>15.00 - 16.30</td>
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## Schedule

**Friday 01st October 2021**  
**09:00 – 17:00 Conference Day 2**  
*(all times in Indonesia Western Time / GMT+7:00)*

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<td>Conference preparation. Participants can enter the online Conference platform (Zoom Meeting).</td>
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<td>09.00 - 09.30</td>
<td>Keynote Speech 5 : Prof. Ahmad Safuan (University of Technology, Malaysia)</td>
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<td>Keynote Speech 6 : Prof. Faisal Fathani (Gajah Mada University, Indonesia)</td>
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<td>9</td>
<td>16.00 - 17.00</td>
<td>Special Session: Retrofitting of Non-Engineering Building (Dr. Teddy Boen, Hiroshi Imai, Lenny, Sarah E. Suryanto, and Dr. Eng. Febrin Anas Ismail)</td>
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<td>17.15 - 17.30</td>
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Join Zoom Meeting :
https://us02web.zoom.us/j/86814255501?pwd=MHRUeFhPeHNLZ0txOUdBSkFpbG93UT09
Meeting ID: 868 1425 5501
Passcode: ICDMM2021

2. Conference Day 2 : October 01\textsuperscript{st}, 2021
Join Zoom Meeting
https://us02web.zoom.us/j/86814255501?pwd=MHRUeFhPeHNLZ0txOUdBSkFpbG93UT09
Meeting ID: 868 1425 5501
Passcode: ICDMM2021
Abstract & Presentation Schedule

The ICDMM 2021 abstracts are also available at the conference's website at the following address:

http://psb.lppm.unand.ac.id/icdmm2021/
PARALLEL SESSION SCHEDULE
THURSDAY, September 30th 2021 (Conference Day 1)

THE ICDMM 2021 : TRANSPORTATION AND LOGISTIC
ROOM : BREAKOUT ROOM 1
TIME : 13.00-14.30 WIB
SESSION CHAIR : YOSSYAFRA, Ph.D

INVITED SPEAKER : ELSA EKA PUTRI, Ph.D
TITLE : OPTIMIZING THE COMPARISON OF SAND AND CEMENT ON FOAM MORTAR

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THE ICDMM 2021 : LESSON LEARNT IN DISASTER MANAGEMENT
ROOM : BREAKOUT ROOM 2
TIME : 13.00-14.30 WIB
SESSION CHAIR : Dr. Eng. PRIMA YANE

INVITED SPEAKER : Dr. MUHAMMAD FARID
TITLE : APPLICATION OF EARTHQUAKE HAZARD MITIGATION IN BENGKULU CITY SPATIAL PLAN USING SHEAR STRAIN INDICATOR

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TIME : 13.00-14.30 WIB
SESSION CHAIR : YOSRITZAL, Ph.D

INVITED SPEAKER : MARLON ERA, Ph.D
TITLE : VERTICAL AND HORIZONTAL ACCOUNTABILITY AMONG STAKEHOLDERS IN DISASTER PREPAREDNESS AND RESPONSE OF TWO HIGHLY URBANIZED CITIES IN METRO MANILA, PHILIPPINES

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ROOM :  BREAKOUT ROOM 4  
TIME :  13.00-14.30 WIB  
SESSION CHAIR :  MASRILAYANTI,Ph.D  

INVITED SPEAKER :  Prof. ERICK MAS  
TITLE :  DEVELOPING TSUNAMI DISASTER MITIGATION TECHNOLOGIES FOR REAL- AND QUASI-REAL-TIME RESPONSE  

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THE ICDMM 2021 : GEOTECHNICAL ENGINEERING  
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TIME : 13.00-14.30 WIB  
SESSION CHAIR : Dr. ANDRIANI  

INVITED SPEAKER : RUSNARDI RAHMAT PUTRA, ST, MT, Ph.D.Eng  
TITLE : OBTAINED SOIL CHARACTERISTIC FROM MICROTREMOR RESULT AND SEISMIC INTENSITY FOR PADANG CITY, INDONESIA

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THE ICDMM 2021 : STRUCTURAL ENGINEERING
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SESSION CHAIR : SABRIL HARIS, Ph.D

INVITED SPEAKER : ERWIN LIM, S.T., M.S., Ph.D
TITLE : PERFORMANCE BASED EVALUATION OF AN EXISTING CONTINUOUS REINFORCED CONCRETE BRIDGE

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THE ICDMM 2021 :  LESSON LEARNT IN DISASTER MANAGEMENT
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TIME      :  15.00-16.30 WIB
SESSION CHAIR :  BENNY HIDAYAT, Ph.D

INVITED SPEAKER :  Dr. Eng. JUNAIDI
TITLE       :  ANALYSIS OF PADANG CITY COMMUNITY PREPAREDNESS TO FACE THE EARTHQUAKE AND TSUNAMI DISASTER

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**TIME** : 15.00-16.30 WIB  
**SESSION CHAIR** : RUSNARDI RAHMAT PUTRA, ST, MT, Ph.D.Eng  
**INVITED SPEAKER** : Dr. ADRIN TOHARI, M.Eng  
**TITLE** : UNDERSTANDING OF SUBSURFACE CONDITIONS CONTROLLING FLOW LIQUEFACTION OCCURRENCE DURING THE 2018 PALU EARTHQUAKE BASED ON RESISTIVITY PROFILES

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TIME : 15.00-16.30 WIB  
SESSION CHAIR : ZULPRIANTO, Ph.D  

INVITED SPEAKER : Ir. HARKUNTI PERTIWI RAHAYU, Ph.D  
TITLE : SENSITIZING SOCIAL AND ECONOMIC VULNERABILITY TOWARD PANDEMIC PREPAREDNESS AND DISASTER RISK REDUCTION FOR AGGLOMERATION CITY  

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THE ICDMM 2021 : COVID 19 DISASTER
ROOM : BREAKOUT ROOM 5
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SESSION CHAIR : YENNY NARNY, Ph.D

INVITED SPEAKER : Laksamana Madya TNI Prof. Dr. Ir. AMARULLA OCTAVIAN, ST., M.Sc., DESD

TITLE : COVID-19 THREAT PROJECTION AND ITS INFLUENCE TOWARD NATIONAL DEFENSE SYSTEM

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INVITED SPEAKER : DEFRIMAN JAFRI, Ph.D
TITLE : THE IMPACT MODEL OF SOCIAL RESTRICTION POLICIES AND NEW HABIT ADAPTATION TO COMMUNITY MOBILITY PATTERNS IN RESPONDING AND CONTROL COVID-19 PANDEMIC IN INDONESIA

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**TIME**: 14.00-15.30 WIB  
**SESSION CHAIR**: JATI SUNARYATI, Ph.D  
**INVITED SPEAKER**: BAI YAN BING, Ph.D

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SESSION CHAIR : Dr. Eng. JUNAIDI

INVITED SPEAKER : EKO PRADJOKO, S.T., M.Sc.  
TITLE : FLOOD DISCHARGE ANALYSIS OF BRANG ODE RIVER AS A DISASTER MITIGATION EFFORT IN KALIMANGO VILLAGE

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YENNY NARNY, Ph.D

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TITLE : IN THE DISTRICT OF SIROMBU, WEST NIAS REGENCY ON
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TITLE : DEVELOPMENT OF NEW FUNCTIONAL SEISMIC BRACE USING PARTIALLY FIBRED CARBON FIBRE REINFORCED POLYMER

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ABSTRACTS
KEYNOTE AND INVITED SPEAKERS
MASONRY BUILDINGS STRENGTHENED WITH TEXTILE REINFORCED CONCRETE (TRC) LAYERS AND FIBER REINFORCED CEMENTITIOUS (FRC) LAYERS

Teddy Boen*1, Hiroshi Imai*2, Lenny*1, Sarah E. Suryanto*1

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*2 Professor Institute of Technologists, Japan, E-mail: h_imai@iot.ac.jp

ABSTRACT

In June 2015, the authors published a paper titled “Brief Report of Shaking Table Test on Masonry Building Strengthened with Ferrocement Layers” [1]. The authors suggested in that paper to replace the traditional way of constructing masonry houses using that so called practical columns and beams (herein after called traditional masonry houses) with bandaging using ferrocement layers on both sides of the walls as skin facings and brick wall as core. Since then, many masonry houses bandaged with ferrocement layers are built in Indonesia. Apart from constructing new earthquake resistant houses, ferrocement bandaging is also used for retrofitting existing as well as damaged houses after earthquakes. In the past decades, continuous fiber mesh was introduced to replace the steel wire mesh in acementitious matrix. Since the early 2000, textile-based composites were used in the field of strengthening and seismic retrofitting of masonry as well as concrete structures. Originally these new “textile fiber composite” materials are called “Textile Reinforced Concrete” (TRC) in Europe. However, in the USA, the term used is “Fiber Reinforced Cementitious Matrix systems” (FRCM). Extensive research on FRCM/ TRC were conducted. A wide variety of publications on the subject matter are now available worldwide. Apart from TRC, thousands of technical studies are published addressing fiber reinforced cement and concrete composite. The term “Fiber Reinforced Cementitious” (FRC) is used and defined as concrete and/or cementitious matrix with suitable discontinuous fibers added to it for the purposes of achieving a desired level of performance in a particular property, such as modulus elasticity, tensile strength, and ductility [2]. Lately, the use of discontinuous fibers as
reinforcement for concrete and cementitious matrix FRC are introduced by many practitioners and civil engineers. Adding fibers in concrete / cementitious matrix mixer simply like adding sand or admixtures, to create a homogenous, isotropic, strong, tough, durable, and moldable structural materials [2]. In this paper the authors used the terms of TRC and FRC as defined by Naaman [2, 3], namely TRC for fibercement with fiber-mesh and FRC for fibercement with discontinuous fiber. This paper provides a simplified global analysis of the overall structure strengthened with FRCM / TRC as well as strengthened with FRC.

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**ASSESSMENT ON EARTHQUAKE RESISTANCE SPECTRAL DESIGN LOAD CRITERIA FOR BUILDINGS AND INFRASTRUCTURES IN INDONESIA**

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**ABSTRACT**

General assessment on earthquake resistance spectral design load criteria for buildings and infrastructures associated with recent development of Indonesian seismic hazard maps is presented in this paper. The assessment is directed toward general identification of their associated risks for input to policy formulation of disaster risk reduction management plans or strategies. Indonesian seismic hazard maps has evolved for the last three-decades. This is originated from early development map prior to 2002, where seismic hazard map particularly for buildings (1983) was developed adopting early process of probabilistic seismic hazard analysis (PSHA) for 200 years return period (RP). Further, 2002 version seismic hazard map has been developed in the form of peak ground acceleration (PGA) for 500 years RP. Spectral design criteria for buildings and bridges have been later developed by updating PSHA involving new seismic source zones,
ground-motion predictive equations and various earthquake RP, accommodating seismic codes for buildings (2500 years RP), for bridges (1000 years RP) and dams involving various RP up to 10,000 years RP correspond to its design level. The spectral accelerations also have included PGA, short (0.2s) period, and 1-s period. The latest update hazard maps (2017) have been developed and adopted for seismic codes for buildings, bridges, dams and other related infrastructures. The increase in spectral design load criteria is identified to assess the general risk of existing constructions, considering results of several recent building damage survey. Adoption of new seismic codes based on the most recent hazard maps along with its enforcement is expected to provide contribution to seismic disaster risk reduction in Indonesia.

HARD AND SOFT MEASURES FOR EARTHQUAKE AND TSUNAMI DISASTER MITIGATION

Junji Kiyono*
1Professor, Graduate School of Engineering, Kyoto University
* kiyono.junji.5x@kyoto-u.ac.jp
ABSTRACT
A destructive earthquake struck the Kobe region on January 17, 1995, and massive earthquake and tsunami struck eastern Japan on March 11, 2011. We present an overview of the casualty aspects of the 2011 Tohoku earthquake compared with those of the 1995 Kobe earthquake. In the Tohoku disaster, some water gates and seawalls saved some villages from the tsunami effects, though some did not. Based on these examples, we discuss the efficiency of soft and hard measures and consider their respective merits and demerits. The main causes of death in the Kobe and Tohoku EQs were, respectively, collapsing buildings and drowning in the tsunami. Although the time to death was very short in both causes, people often have more time to evacuate in the case of an interplate earthquake leading to a tsunami. Basic countermeasures against tsunamis include such hard measures as
STATISTICAL BIVARIATE MODELS IN THE ASSESSMENT OF LANDSLIDE SUSCEPTIBLE ZONES IN THE KOZHIKODE AND WAYANAD DISTRICTS OF KERALA, INDIA

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ABSTRACT

Landslides are one of the most common natural hazards in the hilly areas causing extremely high loss of lives and properties throughout the world. The state of Kerala in India has witnessed heavy torrential rainfall and consecutive triggered landslides in 2018. In this paper, we present, landslide susceptibility map through frequency ratio (FR) and evidential belief function (EBF) models by using Geographic Information System (GIS) for Kozhikode, and Wayanad districts of Kerala, India. At first, a detailed landslide inventory map was prepared from the field survey and satellite imageries. A total of 160 landslides were randomly split into the following two parts: the training dataset 70% (112 landslides) were used for establishing the model and the remaining 30% (48 landslides) were used for the model validation. Thirteen conditioning factors were correlated with landslide occurrence namely, elevation, slope angle, slope aspect, curvature, lithology, land use/land cover, normalized differences vegetation index, topographic wetness index, stream power Index, distance from stream, distance from road, distance from lineaments and water gates, seawalls, and embankments. Soft measures need to be implemented in areas where hard measures are insufficient.
rainfall. Weighted linear overlay method was used to produce the susceptibility map and the resultant maps were further classified into five classes viz., very low, low, moderate, high, and very high. The receiver operating characteristic (ROC) curve method was adopted to validate the performance of the bivariate statistical methods. The results reveal that a final susceptibility map for FR method has the success rate of 85.5% and the prediction rate of 82.42%. Similarly, the EBF model has the prediction accuracy of 81.09% and prediction rate of 79.96%. The developed model is reliable for future land use planning in the two districts to mitigate the risk from landslide hazard.

ROCK SLOPE STABILITY ANALYSIS USING THE TERRESTRIAL LASER SCANNING AND DRONE DIGITAL PHOTOGRAMMETRY METHODS.

Prof. Madya Dr. Ahmad Safuan Bin A Rashid
Associate Chair (Facility),
Fellow of Center of Tropical Geoengineering (GEOTROPIK),
Head of Geotechnical Research Group (GRG),
School of Civil Engineering, Faculty of Engineering,
Universiti Teknologi Malaysia
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ABSTRACT
The conventional method using the Brunton compass to collect the dip, dip direction, spacing, and persistence of steep rock slope surfaces are hazardous and pricey. All this data is essential to analyse the stability of the rock slope structure using the Kinematic Analysis, and Slope Mass Rating (SMR) approaches. Due to overcome this issue, terrestrial laser scanning (TLS) and photogrammetric techniques are proposed. A drone equipped with several cameras was used to gather the rock slope condition. This method could reduce the time and be relatively inexpensive compared to the conventional approaches. In addition, the collected data are in a highly detailed point cloud and could reach a higher location, which is risky to a physical data collection by the geologist. Therefore, in this article, two case studies are shared to
show the application of TLS and digital photogrammetry methods in rock slope analysis. It was found that the gained data from these methods were appropriate for the SMR and Kinematic analyses.

A COMPREHENSIVE STRATEGY OF MULTI-SECTORAL AND COMMUNITY BASED DISASTER MANAGEMENT

Letnan Jenderal Ganip Warsito
Head of BNPB / Head of the Covid-19 Task Force

ABSTRACT

In the last five years, from 2016 to 2020, the National Disaster Management Agency recorded at least 17,032 disasters. This means that every day we experience at least 10 disaster events. Of the total events, almost 99% were hydrometeorological disasters, such as floods/flash flood, landslides, extreme weather, drought and forest and peat fires. A hydrometeorological disaster is a disaster which recurrence follows the wet and dry cycle of weather, meaning that if an area has experienced flooding, it is most likely that the next rainy season will also be affected again if there is no environmental intervention in the catchment area from upstream to downstream. Statistically, disasters repeated at the same areas. There are seven provinces that have historically been subjected to hydrometeorological disasters, namely Aceh, West Sumatra, West Java, Central Java, East Java, South Kalimantan and South Sulawesi.

To reduce the high frequency of this hydrometeorological disaster in particular, and other disasters in general, an ecosystem-based with sustainable multi-stakeholder involvement is needed as a possible permanent solution. Restoration of ecosystems from upstream to downstream must go hand in hand with evaluation of land use at the catchment area. Planting seasonal crops such fruits and vegetables must be balanced with planting those that have function as water absorbers and soil binders, so that the carrying capacity of the environment is maintained, while reducing the risk of wet hydrometeorological disasters. Economical aspects should be in line with ecological consideration. The concept of ecosystem-
based disaster mitigation can also be applied to low frequency of occurrence but high risk disasters, such as earthquakes and tsunamis. The recurrence period which varies from 30 to 1500 years makes the physical structures or concrete-based mitigation options are irrelevant because the optimal function of concrete is limited to only 30 – 50 years. Vegetation options and spatial planning of coastal areas are important if the implementation of these efforts is expected to be sustainable with the support of the community.

STRENGTHENING THE RESILIENCE BY IMPLEMENTING A COMMUNITY-BASED LANDSLIDE EARLY WARNING SYSTEM

Teuku Faisal Fathani\textsuperscript{1}\textsuperscript{,3}, Wahyu Wilopo\textsuperscript{2,3}
\textsuperscript{1}Department of Civil and Environmental Engineering, Universitas Gadjah Mada, Yogyakarta, Indonesia
\textsuperscript{2}Department of Geological Engineering, Universitas Gadjah Mada, Yogyakarta, Indonesia
\textsuperscript{3}Center for Disaster Mitigation and Technological Innovation (GAMA-InaTEK), Universitas Gadjah Mada, Yogyakarta, Indonesia

\textsuperscript{\textcopyright} ABSTRACT
Landslides occur in different topographic and geologic setting and causes great socio-economies losses. It may increase apparently due to the human development expands into unstable hill-slope areas under the pressures of increasing populations. The landslide mitigation efforts may be carried out both structurally and non-structurally. The implementation of mitigation measure for landslide disaster usually focuses on avoiding the mass movement, diverting the moving mass away from vulnerable elements or building reinforcement to protect the threatened elements. However, the importance of monitoring and early warning system can rise when the mass movement mitigation works is considered expensive. This research describes the current progress of mitigation effort in term of the implementation of monitoring and warning system against landslide disasters. An adaptive and sustained landslide early warning system (LEWS) has
been implemented in several hazard prone areas, including the establishment of collaboration among the authority, university, private sector, and the disaster management community. The main purpose of the effort is to establish a strategic approach for disaster risk reduction through the implementation of information flow and command system. The technical system to support landslide disaster risk reduction was developed since 2007, consisting of several technical components such as the instruments for landslide early warning system, supported by the smart-grid for landslide hazard communication, monitoring and early warning. Up to now, the real-time landslide monitoring and early warning was developed and installed at 33 provinces in Indonesia by Universitas Gadjah Mada in cooperation with the Indonesian National Authority for Disaster Management (BNPB) and in Myanmar. The system comprises several sensors namely digital extensometer, wireless tiltmeter, inclinometer, automatic rainfall recorder, ultrasonic/Lidar water level sensor and IP camera, and can be added with other sensors such as pore water pressure and inclinometer sensors. The collected data is sent point to point in a wireless network, radio frequency or satellite. The data is received by a field server, which functions are to receive, store, analyze and resend data to the central server, and decide when to inform early warning. In order to guarantee the effectiveness of the landslide early warning system, the developed system should be simple to operate and appropriately installed in the most suitable sites. Consequently, this system should include the incorporating technical and social approaches. The determination of early warning criteria is considered one of several involvements in technical approach. The understanding on the cause and landslide disaster triggering mechanism is very crucial to establish an appropriate concept and method for monitoring and determining warning criteria for hazard prediction and risk assessment at the region.
COVID-19 THREAT PROJECTION AND ITS INFLUENCE TOWARD NATIONAL DEFENSE SYSTEM

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²³Disaster Management Study Program, National Security Faculty, Republic of Indonesia Defense University, Sentul IPSC area, Tangkil Village, Citeureup District, Bogor 16810, Indonesia
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ABSTRACT

Covid-19 pandemic that is currently experienced throughout the world has led to a great uncertainty upon public health and national economic. The impact of Covid-19 pandemic has shaped the strategic environment landscape with four distinct attributes that might threaten a nation’s survival, namely volatility, uncertainty, complexity, and ambiguity (VUCA). Thus, the government is expected to be able to make swift and timely decision in responding to various threats in the VUCA era. Against the background, this paper discusses issues on global threat projection (especially Covid-19 pandemic) and its influence toward national defense system, the re-actualization of Total Defense System in VUCA era, and the implementation of Total Defense System in responding to the threats dynamic. To discuss the topic, this study analyzed the influence of global threats resulted from Covid-19 pandemic on national defense system, and how Total Defense System is re-actualized and implemented in VUCA era. The theoretical foundations employed in this study are securitization, neo-malthusian, food security, dan society empowerment theories. The changing shape of threats has to be paid careful attention in formulating policy on national defense system. In line with the complexity of threat characteristics in VUCA era, the “re-actualization” of Total Defense System has become an urgency given the current context. Against the current threats dynamics, the implementation of Total Defense System could be examined from national food resilience and society empowerment factors. Total Defense System has to put people’s
roles in the forefront by guaranteeing the availability of basic necessity. By doing so, the people's loyalty in both national defense and Total Defense System will improve along with people's welfare improvement.

APPLICATION OF EARTHQUAKE HAZARD MITIGATION IN BENGKULU CITY SPATIAL PLAN USING SHEAR STRAIN INDICATOR

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ABSTRACT

The city of Bengkulu, located on the west coast of Sumatra Island, Indonesia, is very vulnerable to earthquakes. On that basis, seismic hazard mitigation should be prioritized in this developing city. This paper presents the seismic hazard mapping on the basis of shear strain indicator for spatial plan in Bengkulu City, Indonesia. The values of ground shear strain can be the indicator for the possible damage that could occur in an area. This study was initiated by performing geophysical measurements using microtremor to obtain the geophysical description of study area. The analysis of horizontal to vertical spectral ratio (\(H/V\)) was further performed to determine peak amplitude (\(\gamma\)) and predominant frequency (\(f_{\text{p}}\)). From those parameters, the empirical analyses of vulnerability indices (\(\xi\)) and ground shear strain (\(\gamma\)) were conducted. All results such as \(\xi\), \(\gamma\), and \(\gamma\) were depicted in microzonation maps. The results showed that Bengkulu City was generally vulnerable to undergo seismic impact. The concern was focused along coastal area of Bengkulu City since the liquefaction damage could occur in this area. Results of this study could bring a recommendation to stakeholders to consider seismic hazard mitigation for Bengkulu City.

Keywords: Earthquake, Mitigation, Shear strain, Spatial planning.
VERTICAL AND HORIZONTAL ACCOUNTABILITY AMONG STAKEHOLDERS IN DISASTER PREPAREDNESS AND RESPONSE OF TWO HIGHLY URBANIZED CITIES IN METRO MANILA, PHILIPPINES

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ABSTRACT
This paper focuses on the delivery of disaster preparedness and response at the city level based on Republic Act 10121, the national disaster risk reduction and management law of the Philippines. The paper draws lesson from the experiences of two highly urbanized cities in the Metro Manila and how the coordinated efforts from the national to the city level affect the quality of disaster preparedness and response. This provides deeper understanding on how city governments fulfill their commitments and responsibilities to their citizens in the context of disaster preparedness and response. This study utilized key informants interview and focus group discussion among key members of the city disaster risk reduction and management council and review of the existing laws and relevant policies. There is a limited studies conducted on the roles responsibilities and accountabilities of the local government as mandated by two national laws, the Local Government Code of 1991 (RA 7160) and the (RA 10121) National Disaster management Law. The paper hopes to provide fresh insights and recommendations on how to improve governance of disaster preparedness and response at the city level.

DEVELOPING TSUNAMI DISASTER MITIGATION TECHNOLOGIES FOR REAL- AND QUASI-REAL-TIME RESPONSE

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ABSTRACT

Tsunamis are among the deadliest events in the human history of disasters. Sensing and monitoring technologies enable us to forecast, follow and prepare for possible impacts. In this presentation, I will share our current work on real-time tsunami and evacuation simulation. In addition, I will present applications of satellite remote sensing for building damage mapping in quasi-real-time for disaster response.

OBTAINED SOIL CHARACTERISTIC FROM MICROTREMOR RESULT AND SEISMIC INTENSITY FOR PADANG CITY, INDONESIA

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ABSTRACT

Several powerful earthquakes have struck Padang during recent years, one of the largest of which was an M 7.6 event that occurred on September 30, 2009 and caused more than 1000 casualties. Following the event, we conducted a questionnaire survey to estimate the shaking intensity distribution during the earthquake. About 500 residents of Padang were interviewed. The residents received explanations for each item on the questionnaire from the interviewers, and answers were filled in directly on the answer sheets. From this survey we produced a map of the shaking intensity distribution in Padang. In addition to the questionnaire survey, we performed single observations of microtremors at 110 sites in Padang. The results enabled us to estimate the site-dependent amplification characteristics of earthquake ground-motion. We also conducted a 12-site microtremor array investigation to gain a representative determination of the soil condition of subsurface structures in Padang. From the dispersion curve of array observations, the central business district of Padang corresponds to relatively soft soil condition with Vs 30 less than 400 m/s, the predominant periods due to horizontal vertical ratios (HVSRSs) are in the range of 2.0 to 4.0 s, and the seismic intensity
obtained is upper 5 (5+) in the JMA I scale. By making these observations, we can obtain a relationship between soil types, predominant periods and seismic intensities.

THE IMPACT MODEL OF SOCIAL RESTRICTION POLICIES AND NEW HABIT ADAPTATION TO COMMUNITY MOBILITY PATTERNS IN RESPONDING AND CONTROL COVID-19 PANDEMIC IN INDONESIA

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ABSTRACT
Several powerful earthquakes have struck Padang during recent years, one of the largest of which was an M 7.6 event that occurred on September 30, 2009 and caused more than 1000 casualties. Following the event, we conducted a questionnaire survey to estimate the shaking intensity distribution during the earthquake. About 500 residents of Padang were interviewed. The residents received explanations for each item on the questionnaire from the interviewers, and answers were filled in directly on the answer sheets. From this survey we produced a map of the shaking intensity distribution in Padang. In addition to the questionnaire survey, we performed single observations of microtremors at 110 sites in Padang. The results enabled us to estimate the site-dependent amplification characteristics of earthquake ground-motion. We also conducted a 12-site microtremor array investigation to gain a representative determination of the soil condition of subsurface structures in Padang. From the dispersion curve of array observations, the central business district of Padang corresponds to relatively soft soil condition with Vs 30 less than 400 m/s, the predominant periods due to horizontal vertical ratios (HVSRS) are in the range of 2.0 to 4.0 s, and the seismic intensity obtained is upper 5 (5+) in the JMA I scale. By making these
observations, we can obtain a relationship between soil types, predominant periods and seismic intensities.

UNDERSTANDING OF SUBSURFACE CONDITIONS CONTROLLING FLOW LIQUEFACTION OCCURRENCE DURING THE 2018 PALU EARTHQUAKE BASED ON RESISTIVITY PROFILES

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ABSTRACT
The 7.4 Mw earthquake on 28th September 2018 in Palu City triggered a flow liquefaction phenomenon in the Balaroa and Petobo areas, contributing to significant casualties and building damage. This paper presents the results of a liquefaction study to map subsurface conditions in these areas using the multi-electrode resistivity method with the dipole-dipole configuration. The objective of this study is to understand factors controlling the flow liquefaction phenomenon. Based on the interpretation of 2-D resistivity images, the liquefied soil layers are characterized by lower resistivity values than the non-liquified layers. These contrasts of resistivity values form a gently sloping boundary between the liquefied and non-liquefied soil layers. The resistivity image perpendicular to the flow direction indicates the presence of a subsurface basinal morphology in the Balaroa area, suggesting that a shallow groundwater zone is present within the liquefiable soil layer. Thus, the subsurface topographical condition is the main governing factor of flow liquefaction phenomena during the 2018 Palu earthquake.
SENSITIZING SOCIAL AND ECONOMIC VULNERABILITY TOWARD PANDEMIC PREPAREDNESS AND DISASTER RISK REDUCTION FOR AGGLOMERATION CITY

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ABSTRACT

Metropolitan areas, such as Greater Bandung in Indonesia, are a vital geographic unit for nations to sustain economic growth and development. However, they blur the boundaries between cities and peripheral regions, and make traditional city boundaries, often imposed by administrative needs, essentially obsolete. The importance of an integrated approach to development and disaster preparedness is particularly acute when they are threatened by a range of natural, technical and biological hazards, including pandemics such as COVID-19. Greater Bandung is located in a mountainous plateau region in the central-west portion of West Java province and has the third highest population of any metropolitan area in Indonesia. It is surrounded by active volcanoes, a number of faults and complex river systems that pose significant hazards, including earthquakes, volcano eruptions, frequent floods and landslides. To have better integrate pandemic preparedness and disaster risk reduction, an initiative of this ongoing research has been able to identify and sensitize social and economic vulnerability and capacity of agglomerated cities and regencies. Such vulnerability factors toward covid19 pandemic are population density, distribution of market and supermarket, growth domestic products, and poverty index. Sensitizing these social and economic vulnerability to pandemic preparedness and disaster risk reduction for the agglomerated cites and regencies will improve not only to mitigate the disaster risk but also increase...
preparedness and protect assets from further damage due to natural hazard during and after covid19 pandemic.

PERFORMANCE BASED EVALUATION OF AN EXISTING CONTINUOUS REINFORCED CONCRETE BRIDGE

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ABSTRACT

A performance based evaluation was conducted on an eleven span reinforced concrete bridge located in a high seismicity area. This bridge was designed using SNI 2833:1992 and is checked using the updated Indonesian seismic hazard map. In addition, a non-linear time history analysis was conducted using eleven pairs of ground motion to evaluate the structural performance of the bridge pier for the anticipated service life. Elastic analysis shows that the existing bridge still satisfies the strength and serviceability requirement in spite of the increase in seismic demand. Meanwhile, by evaluating the average inelastic longitudinal reinforcement and concrete strain at bridge pier for selected eleven ground motions, this study suggests that the bridge is still “fully operational” and “life safety” when subjected to lower level (100 year return period) and upper level (1000 year return period) ground motions, respectively.

FLOOD DISCHARGE ANALYSIS OF BRANG ODE RIVER AS A DISASTER MITIGATION EFFORT IN KALIMANGO VILLAGE

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ABSTRACT
Flood is a hydrometeorological disaster that often occurs in West Nusa Tenggara, especially in the Brang Ode River, Kalimango Village, Alas District, Sumbawa Regency. One of the worst floods ever occurred was on December 12th, 2016 which caused several villages to be inundated and houses along the river washed away. This study aims to obtain the peak discharge from the worst flood that has ever occurred. This model is simulated using HECRAS 5.0.7 and QGIS for mapping the flood inundation area. Terrain data used DEMNAS. The peak discharge is obtained from the modelling results based on the flood inundation area which was validated with the flood map from DESTANA (disaster resilient village) Community of Kalimango Village. The modelling results showed that the peak flood discharge is 950 m3/sec with the inundation area is 150,752.07 m2. The real peak flood discharge can be smaller or larger than the modelling results. This may be affected by the DEMNAS raster data accuracy.

COLLECTIVE MEMORIES OF THE SIROMBU COMMUNITY, IN THE DISTRICT OF SIROMBU, WEST NIAS REGENCY ON THE EARTHQUAKE AND TSUNAMI IN 2005 AND 2006

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ABSTRACT

This study discusses the collective memories of people experienced natural disasters, earthquakes and tsunamis in the remote village of Sirombu, Nias Islands in 2004 and 2005. Their narratives of surviving in the midst of limitations during the post-earthquake are the main points of study. Using ethnographic studies and oral histories, this study raises the understanding of the victims on their experiences in dealing with the geographical conditions of their homes and island that are prone to natural disasters. The findings show that the victims are able to develop an adequately effective pattern of survival by carrying out several innovations, which are based on both local wisdom and modern knowledge on disaster management.
DEVELOPMENT OF NEW FUNCTIONAL SEISMIC BRACE USING PARTIALLY FIBRED CARBON FIBRE REINFORCED POLYMER

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ABSTRACT

This study proposes new tension member with buckling-free function using carbon fibre reinforced polymer for seismic bracing system. Firstly, concept of the composite brace; a partially fibred carbon fibre reinforced polymer brace, is introduced. Secondly, material strength of the composite brace moulded by modified pultrusion is investigated. Finally, cyclic loading tests to simulate the seismic loading are conducted. As the results, it was demonstrated that seismic brace system using the composite brace can provide buckling prevention and plastic deformation performance to absorb vibration energy.

OPTIMIZING THE COMPARISON OF SAND AND CEMENT ON FOAM MORTAR

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ABSTRACT

Riau Province has the largest soil with low bearing capacity (peat) on the island of Sumatra, the peat depth in some places can reach 16 meters. In this condition, if the road is built on the peat soil, the
road will quickly decline and damage. The Road and Bridge Research Center (PUSJATAN) in 2013 discovered the Mortar Foam Light Pile technology. Based on these findings, this study aims to optimizes the ratio of Sand and Cement in the manufacture of Mortar Foam. The sand comes from Teratak Buluh Village, Kampar Regency, Riau Province and Semen Padang PCC comes from Padang City, West Sumatra Province. The ratio of cement and sand starts from: 1:0.7, 1:0.8, 1:0.9, 1:1, 1:1.1 and 1:1.2. Cylindrical samples with a diameter of 10 cm and a height of 20 cm were subjected to a compression test using a modified CBR tool at the age of 7 days. From the test results, samples float in water at a ratio of 1:0.7 with a weight of 0.77 T/m³ and a compressive strength of 901.20 Kpa and at a ratio of 1:0.8 with a weight of 0.83 T/M³ and a Compressive Strength of 971 Kpa.

SLIP SURFACE IN NARROW BACKFILL BEHIND RETAINING WALL

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ABSTRACT
Liquefaction potential analysis is a challenging field of study since it deals with uncertainty in earthquake science. However, the use of simple analytical methods to estimate the liquefaction potential will be a preferred choice for practitioner. Fortunately, there has been a lot of previous data showing that loose sand that is saturated with groundwater has been often or easily liquefied. The physical properties of sand that mostly affect the liquefaction resistance are the density and grain size. The denser the sand layers are more difficult to liquefy. The finer the grain size is the easier to liquefy. Both parameter together with the acceleration of
the ground motion has been compiled to give a practical liquefaction potential analysis. This paper describes the application of liquefaction potential analysis based on its relative density and average grain size method. The method has been widely applied and the results are satisfactory in terms of determining the liquefaction potential for several levels of earthquake acceleration

ANALYSIS OF PADANG CITY COMMUNITY PREPAREDNESS TO FACE THE EARTHQUAKE AND TSUNAMI DISASTER

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ABSTRACT
Padang, West Sumatera located in the collision area of two tectonic plates, namely Indo-Australia and Eurasia which was marked by the presence of a tectonic earthquake centre in the Mentawai islands and surroundings. Realizing the high risk of disasters, the people of Padang city must be ready and prepared to respond and accept the responsibility for the possibility of earthquake and tsunami. To reduce the risk of disaster, the use of self-help and mutual-help parameter might be the best way to help the people to know "what should they do?" and "how can they do it?" to protect themselves from disasters. This research aims to analyze the Padang city community preparedness to face the Earthquake and Tsunami disaster by using self-help and mutual-help parameter. A questionnaire consists of 20 questions was used to collect the data. The sample size of this research is 400. The data was collected from 4 different areas (Random area, Pondok area, Purus area, and Ulak Karang area). The study found that the Padang city community might not prepare to face the earthquake and tsunami disaster in the future in terms of self-help and mutual-help as most of the items mentioned in the questionnaire have not been applied. The government was urged to develop proper policies regarding risk reduction further.
NETWORKS WITHIN NETWORKS: SCALING RESPONSE OPERATIONS IN THE LIGHTNING COMPLEX FIRES IN NORTHERN CALIFORNIA, AUGUST 2020

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ABSTRACT

Networks play critical roles in mobilizing response to urgent events, and none is more challenging than in response to the sudden, urgent demands of wildfire. On August 16-17, 2020, an extraordinary meteorological event occurred in northern California when the waning Tropical Storm Fausto sparked a series of thunderstorms over northern California. The storm brought little rain but sparked over 11,000 dry lightning strikes in the region igniting grasslands and timber stands of the region already scorched by summer heat. Within days, three major wildfires were burning in seven counties ringing the San Francisco Bay Area. Termed the Lightning Complex Fires, the fires burned over one million acres, including 10,000 structures, and led to over $24 billion dollars in damages, including property and fire suppression costs. This paper characterizes the networks of organizational support that emerged in response to the extraordinary demands of the 2020 Lightning Complex Wildfires in Northern California. Multiple networks emerged, blending experienced fire personnel with volunteers, interagency experts, and uses of advanced technologies to connect and reinforce operations in damaged, dangerous fire environments. The analysis uses situation reports from CalFire to identify the types of networks engaged in field operations as they battled the fires: planned networks that followed the formal procedures of the Standardized Emergency Response System (SEMS); emergent networks that formed among residents as they sought to organize their own informal response; operational networks that blended elements of both planned and
emergent networks to adapt creatively to the urgent, dangerous conditions in a rapidly changing context, and experts who provided intelligence on regional wildfire operations. Using parameters derived from CalFire Situation Reports, this analysis represents an initial step in developing a system dynamics model of information flow among the four networks in wildfire operations.
PARALLEL SESSION
SPEAKERS
OVERVIEW OF 1990S DEADLY TSUNAMIS IN INDONESIA

Admiral Musa Julius¹,²,³ and Daryono¹

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ABSTRACT

In the 1990s there were 7 (seven) deadly tsunami events due to earthquakes in Indonesia. There are M 7.8 North-east of Flores island sea earthquake (1992), M 7.6 South of Java island sea earthquake (1994), M 6.8 South of Timor Island sea earthquake (1995), M 7.8 North-west of Sulawesi island sea earthquake (1996), M 7.9 East of Biak island sea earthquake (1996), M 7.7 Taliabu island sea earthquake (1998), and M 7.4 East of Banggai Island sea earthquake (2000). Those earthquake and tsunami disasters events affected the number of casualties and damaged houses in coastal areas. Surely those events present a few lessons learned for future disaster preparedness in.

DESIGNING BLOOD SUPPLY POLICY USING SIMULATION APPROACH

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ABSTRACT

Blood transfusion is one of the critical requirements of many medical treatments. To ensure timely blood availability, the Indonesian Red Cross (Palang Merah Indonesia/PMI) has to tackle the blood supply challenges of stockouts and overdates. This research aims to develop a simulation model to determine the
blood supply policy to reduce stockouts and overdates. The simulation model was developed according to the existing system at UDD PMI Padang. Simulation experiments were then attempted with some sequential scenarios and carried out on variables that affect the blood supply. The simulation result recommends the blood supply policy to reduce blood stockout and overdate at a higher service level, at conditions of the blood demands are assumed to be constant or increase.

FACTORS ASSOCIATED WITH COVID-19 TEST WILLINGNESS IN INDONESIA: TELE-SURVEY STUDY AFTER ‘NEW NORMAL’ POLICY IN RISK GROUPS

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ABSTRACT
The COVID-19 test is an initial step to control the spread of the disease. It is important to acknowledge that data about disease diagnosis test is useful as a foundation for various purposes. Therefore, in order to acquire comprehensive data regarding the COVID-19 test willingness of Indonesian people, a study has been conducted. This study underlines factors that might influence a person, who are at high risk of COVID-19, to be willing to test for COVID-19 independently in a developing country like Indonesia. This is a quantitative population-based study with a cross-sectional design conducted in risk groups resides in Pangandaran Regency, Indonesia in 2020. The data was collected using a tele-survey technique (telephone interview) with a closed-ended electronic questionnaire as an instrument and 400 people as the samples. Multivariate analyses applied between factors such as age groups, gender, income, COVID-19 confirmed neighbourhood, information
seeking intensity, social media exposure, and willingness to test for COVID-19. The results showed that more respondents stated that they did not want to take the COVID-19 test than those who did. The majority of respondents stated that the reason they did not want to take the COVID-19 test was that they felt it was unnecessary and the test was considered expensive. This research also shows that factors such as last education level, income per month before new normal, COVID-19 confirmed neighbourhood, information seeking intensity, and social media exposure have the potential to influence the willingness for a COVID-19 test.

ICDMM-2916

HYDRAULIC CONDUCTIVITY AND CALCIUM CARBONATE CONTENT OF BIOCEMENTED HEAVY-METAL CONTAMINATED MINE WASTE SOIL

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ABSTRACT

It is not uncommon for mining activity to generate wastes associated with negative engineering impacts include susceptibility to runoff due to absence of vegetation, erosion and sinkhole. Due to their highly degree of permeability, movement of heavy metal contaminants in waste soils and aquifers occurs actively along the hydrogeological parameters and research on using biocementation method such as enzyme induced calcite precipitation (EICP) to reduce the hydraulic conductivity is therefore beneficial. Mine waste soil collected from copper mine
in Lohan Dam, Sabah is characterized physically, morphologically, and chemically then treated with EICP under different operational parameters include curing durations (1, 3, 7 days), curing temperatures (5, 10 and 25 °C) and relative density (70 and 80%). The hydraulic conductivity was then tested using constant head permeability test and the calcium carbonate content (%) is determined using HCL washing method. Properties of the Lohan Dam wastes are found to be predominantly coarse grain soil of low plasticity, high specific gravity, high permeability, acidic in nature and low organic content. Morphologically, they are composed of powdered and hardened particles with dark brown colour with high amount of irregular-shaped particles. Mineralogical, Lohan Dam soil wastes contains high level of heavy metals beyond the safety level of Department of Environmental Malaysia. EICP treatment was has change the degree of permeability from ‘high and medium’ to ‘low’ with 94-97% reduction in hydraulic conductivity corresponding to the amount of calcium carbonate content produced ranging 6.94-9.63%. In conclusion, relative density shows marginal effect, curing duration and temperature shows more significant impact to the treatment effectiveness.

GOVERNING SUSTAINABLE TOURISM IN TIME OF COVID-19 DISASTER: EMPIRICAL EVIDENCE FROM BINTAN, KEPULAUAN RIAU

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ABSTRACT
The COVID-19 disaster has brought various negative effects on human activities, including the tourism sector. However, only a few studies have given attention to the development and governance
of how tourism is managed by the stakeholders during the COVID-19 pandemic. The purpose of this study is to explain the governance of sustainable tourism during the COVID-19 outbreak. The research was conducted in Bintan Regency, Kepulauan Riau, by using a qualitative approach. The data were collected using an interview with several tourism stakeholders, involving business actors, resort owners, government, and village officials. The results suggest that the governing process of tourism in Bintan focused on formal policy and implementation. The government and business actors become crucial actors in helping the sustainability of tourism during the COVID-19 pandemic. Our study can be used as a valuable recommendation to the government in managing tourism in the era of COVID-19.
The decrease in the need to leave the house was average 57.7%, the choice not leaving house increased by 76.9%, frequency leaving the house 1-2 times increased by 50%, then for leaving the house 3-4 times, it decreased by 68.8% and leaving the house more than 5 times decreased by 80%. Time of leaving houses in the morning it increased by 13.9%, during the day it decreased by 56%, in the afternoon it decreased by 58.4% and at night it decreased by 74.8%, the use of vehicle modes decreased by 14.9% and the number of people traveling outside the house decreased by 23.2%. The performance of restrictions on people’s movement policy in West Sumatera is still not optimal, although there is decreasing people’s movements, but many people did not know the detail of policies. Several recommendations have been developed to increase those policy performances.
is able to deliver damage to the physical environment. Hence, it is required to analyse the objects exposed by an active earthquake source in Bandung Basin. The exposed objects that experience the most impact due to the shock of the earthquake are residential buildings. West Bandung Regency was opted as our study area due to the high-risk zone for earthquake waves based on seismic hazard calculation. This paper tried to estimate the seismic exposure as the impact of earthquake waves around Bandung Basin on physical buildings in West Bandung Regency using a geospatial analytics approach. The result shows that the location area with many damaged buildings correlates with the spatial distribution of surface peak ground acceleration.

SEISMIC HAZARD ON WEST BANDUNG DISTRICT USING NON-LINEAR EARTHQUAKE RESPONSE ANALYSIS

Anggun Mayang Sari\textsuperscript{1,5}, Afnindar Fakhrurozi\textsuperscript{1}, Arifan Jaya Syahbana\textsuperscript{1,2}, Dwi Sarah\textsuperscript{1}, Bambang Setiadi\textsuperscript{1}, Mudrik Rahmawan Daryono\textsuperscript{1}, Rabieahtul Abu Bakar\textsuperscript{3} and Jian Cheng Lee\textsuperscript{4,5}

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ABSTRACT

West Bandung District is one of the government areas that grow rapidly in West Java. Here several infrastructures such as Highspeed Rail Development, Modern Residences, Tourist Attractions Area and International Retail Company contribute significantly to economic development. Rapid construction in Bandung Basin caused the government to pay attention to risk
factors, especially building structures. One of the natural hazards that must consider is the presence of an active Lembang fault. Therefore, there is a need for a study that considers how the earthquake waves damaged the buildings. In this study, an analysis of the soil dynamics due to earthquake ground motion from bedrock was carried out. The analysis used the wave propagation method, a non-linear earthquake response analysis. The research was analysed in 12 points locations in West Bandung District. As a result, the location with the highest PGA surface value is defined in the Mekar Jaya area, while the lowest risk is found in the Cililin area. Furthermore, this study provides scientific information on seismic hazards to support government disaster risk reduction programs.

ICDMM-137

COLLABORATIVE GOVERNANCE MODEL IN COVID-19 PANDEMIC MITIGATION: A TEMPORARY UNCONDITIONAL CASH TRANSFER PROGRAM

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ABSTRACT

The Covid-19 disaster has spread all over Indonesia, causing a sense of laziness for people in the economy by paying very large costs, limited activities, and even losing their jobs. The government through the direct cash assistance program as a mitigation measure in reducing the impact of the Covid-19 pandemic, but so far it has not been effective. The purpose of this study was to determine the ideal cooperative governance model for the cash transfer program during the COVID-19 pandemic. This study uses a qualitative method with a descriptive approach. The results of this study indicate that the cash transfer program still has many obstacles in distributing it to many people who are not on target, this is the result of collaboration between stakeholders such as the
Social Service, Population and Civil Registry Office, Village Government, Village Community, Coordinator Team Field, and the Covid-19 Task Force Team. Researchers in an effort to increase cooperation between these stakeholders by strengthening on several sides such as: First, the government conducts data collection and systematic data collection between the recommendations of the names of beneficiaries from the village with the approval by the Population and Civil Registry Office and the Social Service Office. Second, the Government and the Community carry out monitoring and supervision. The desired impact is that the temporary unconditional cash transfer program can run effectively and benefit people in need. This program is a social network during the Covid-19 period.

FLUID BEHAVIOUR ANALYSIS IN THE PROCESS OF LIQUEFACTION USING KORINOFACTION DEVICE

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ABSTRACT

Earthquakes can be followed by liquefaction, which is a response of saturated soil when it is subjected to shock or stress that cause loss of soil strength or bearing capacity as an impact of the increasing of soil pore water and the loss of the soil stress's effectiveness. This research using Korinofaction that work to cause cyclic loads or vibrations that come from DC servo motor with an adjustable speed and force. The earthquake's strength is measured by the number of rpm measured on the digital tachometer. Korinofaction is equipped with plumbing system to observe fluid behaviour during liquefaction. The results of
research showed that silty sand and silt was liquefied in VIII MMI earthquake and cause the occurrence of water flow on the surfacedue to increase soil pore stress. The flow rate that triggers liquefaction in the silty sand is 0,00006769 m\(^3\)/second, and silt is 0,00005 m\(^3\)/second. The water flow that flows in the silty sand had permeability of 4,76 x 10\(^{-4}\) cm/second while on the silt is 6,09 x 10\(^{-4}\) cm/second.

**ABSTRACT**

A high potential area for landslides was identified in the upstream of the Air Beras River on Bukit Beriti Besar which was feared to generate debris flow through the Air Beras River. One of the preventive efforts that can be conducted for debris flow is sabo dam. This study aims to design a series of conduit sabo dam and evaluate the structure stability according to SNI 2851:2015 and Technical Standards and Guidelines for Planning and Design of Sabo Structures (JICA, 2010). By using the design discharge of debris flow of 120 m\(^3\)/s, the velocity of 5.06 m/s, and the inclination of riverbed of around 6.16\(^\circ\), the spillway height of the Sabo Dam 1 was determined to be 3 m, while spillway height of Sabo Dam 1 was 2 m. The Sabo Dam 1 has a height of 10 m and a width of 30 m with a total manageable volume of 49,600 m\(^3\) while the Sabo Dam 2 has a height of 10 m and a width of 45 m with a total manageable volume of 91,500 m\(^3\). The safety factors of the sabo
dam in the debris flow condition were 2.14 for overturning, 1.50 for sliding, and 5.74 for bearing capacity. Based on the result, the conduit sabo dam series effectively controls the destructive power of debris flow.

ICDMM-167

FORMS OF GOVERNMENT COLLABORATION AT THE LOCAL LEVEL IN HANDLING THE COVID-19 DISASTER

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ABSTRACT

The current COVID-19 disaster requires serious handling, with the involvement of various stakeholders. A different approach is shown by Nagari Pasie Laweh which is one of the Nagari (Village) in West Sumatra, using a people-based approach which means that the low-level government (Nagari) collaborates with non-governmental local actors to handle and prevent Covid-19 with a different approach. The purpose of this research is to see how the efforts or forms of collaboration made by the Nagari Government with local actors deal with the Covid-19 disaster. This study uses a qualitative method with a descriptive approach and data collection techniques using literature studies from various articles/journals and related sources that help answer research questions. The results of this study show that the collaboration carried out by the Nagari government has made the handling of the Covid-19 disaster more optimal. Disaster management using a people-based method involves local non-governmental actors called the tigo tungku sajarangan (ninik mamak, alim ulama, cadiak pandai). The involvement of these actors helps the policies will be suitable with people's need, this effort also facilitates communication between the government Nagari with society, so that collaboration raises public confidence towards the policy applied in Nagari. The
forms of collaboration include the provision of a Rumah Gadang (west sumatera traditional house) as an isolation house, the provision of Ulayat (ethnic group) land that can be used for the community to help ease the economic burden. Apart from that, all forms of handling the Covid-19 disaster, the Nagari government always involves and collaborates with Ninik Mamak (traditional leader) from each clan to make efforts more optimal.

LOCAL WISDOM OF COASTAL COMMUNITIES IN MITIGATING EARTHQUAKE DISASTER RISK REDUCTION

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ABSTRACT
To describe the implementation of local wisdom of coastal communities in earthquake disaster risk management. This study employed interviews and literature review. Result is Disaster management can be conducted from various perspectives, one of which is through mitigation based on local wisdom of coastal communities to reduce (earthquake) disaster risk. In this study, researchers only explained how the application of local wisdom of coastal communities in natural disasters (mitigation). This study provides an additional reference related to disaster mitigation by utilizing local wisdom of the community, especially in the field of public administration, as well as provides a more specific study of the implementation of local wisdom of coastal communities in earthquake disaster risk management.
HEALTH MANAGEMENT OF COLLEGE STUDENT DURING THE COVID-19 PANDEMIC

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ABSTRACT

Early 2020 the world was hit by the Covid-19 outbreak. This virus originated from Wuhan, China and hit 216 countries. In Indonesia there is an increasing trend of data cases on June 11, 2020, as many as 35,295 positive people. This study aims to look at Learning Management during the pandemic and the health impacts of students. As a result of the pandemic, lecture activities that were originally on campus were moved to homes with a distance learning system. The descriptive research method is authoritative with a sample of 96 students. Sudden planning in learning, poor coordination, less supportive facilities and environment, monotonous learning, multiple tasks and one-way communication make students feel bored and have an impact on health anxiety and fatigue.

THE PREPAREDNESS OF SCHOOL COMMUNITY IN FACING TSUNAMI DISASTER IN LHOKSEUMAWE CITY

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ABSTRACT

Tsunami in Aceh in 2004 resulted in many casualties and damage to educational facilities. The disaster taught about the importance of preparedness in anticipating disasters to humans. It will help in shaping and planning what actions need to be taken in the event of a disaster. The aim of this study was to see the level of
preparingness of school community in Lhokseumawe City in dealing with the tsunami disaster. School community preparingness was measured using preparingness parameters, namely knowledge and attitudes; policies and guidelines; emergency response planning; disaster warning system; and resource mobilization. This research is a descriptive quantitative research employing survey method using a closed questionnaire. Utilizing the descriptive percentage method, the research shows that the school community's preparingness in Lhokseumawe City is in the almost ready category with an index value of 57.02. The index value is obtained by adding up the index values for each parameter by taking into account on its weight. The index value of the knowledge and attitude parameter of the school community; and the level of school community policies and guidelines is in the ready category with index scores of 68.24 and 65. School community emergency planning parameters; the level of the school community disaster warning system and the level of resource mobilization are in the unprepared category; not yet ready and almost ready with index values of 35.6; 40; and 54.15 respectively.

THE CONCEPT OF AN EARLY WARNING SYSTEM FOR THE USE OF NUCLEAR TECHNOLOGY IN INDONESIA

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ABSTRACT
The application of nuclear power plants in the world is increasing and has the potential for accidents, including nuclear weapons tests from outside the Nuclear Non-Proliferation Treaty, thus allowing radioactive releases to fall into Indonesian territory, which
is a potential threat. Indonesia also utilizes nuclear power in many fields, thus also potentially become a national threat. To prevent the threat of radiation potential requires a nuclear disaster Early Warning System (EWS) that can be accessed by the community. This research analysed the EWS that Indonesia needed, using qualitative methods by describing the results of research obtained from interviews and secondary data. Results and research discussions starting from observation and monitoring of radiation exposure, warning services, information dissemination, and supported by countermeasures for the effectiveness of the EWS. The results showed that the development of an integrated nuclear disaster EWS that is easily accessible to the community quickly and continuously in accordance with the development of an emergency is a strategy as a decision to reduce the risk of nuclear disaster. The development of the strategy requires legal basis that regulates coordination between ministries/institutions, from planning to information dissemination to ensure the safety of the public and Indonesian people security.

ICDMM-7027

IMPROVING FOOD SECURITY THROUGH URBAN FARMING WORKSHOP FOR DISASTER RISK REDUCTION: EVIDENCE FROM JOGOYUDAN VILLAGE, YOGYAKARTA AS A RESILIENT CITY

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ABSTRACT

This study aims to determine the effect of the implementation of urban farming workshops on food security of Jogoyudan Village residents supporting the concept of Yogyakarta as a Resilient City as a disaster risk reduction. This study is a quasi-experimental study using a nonequivalent pretest-posttest control group design.
This study involved 200 residents in 4 RWs (Neighborhoods) in Jogoyudan Village as the research sample selected by cluster random sampling. RW 08 and RW 10 as the experimental group, while RW 11 and RW 12 as the control group. The research data were collected through assessment instruments in the form of pretest and posttest that were analyzed quantitatively, as well as using the method of observation and documentation. The result of this study indicates that the implementation of the urban farming workshop has a positive effect on improving the understanding level of food security of the people in Jogoyudan Village as evidenced by the value of the Wilcoxon test of 0.000 (α > 0.05) and the Mann-Witney test of 0.000 (α > 0.05). In addition to that, the urban farming workshop can also provide participants with farming skills, which can facilitate greater and easier access for food which is the main indicator of food security, as attested by the experimental group in Jogoyudan Village who was able to independently make hydroponic installations at their homes. This shows that the urban farming workshop can be one of the ways toward disaster risk reduction supporting the realization of Yogyakarta as a Resilient City.

ICDMM-7037

ENHANCING PANDEMIC RESILIENCE: PLANNING AND INSTITUTIONAL RESILIENCE, A LEARNING MODEL FOR INDONESIA

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ABSTRACT

The Covid-19 pandemic is one of the most expensive and destructive threats facing millions of people around the world. Policymakers generally have a linear worldview and can help the economy and society to track epidemic shocks and crises by
pulling the right levers. For example, in recent years, Ebola, MERS, Zika, and SARS have demonstrated a limited willingness to respond promptly and responsibly. The pandemic emphasises the need to be more proactive. Yet, existing epidemic response frameworks are either disease-specific, category-specific, or non-specific, with no comprehensive framework encompassing all components of institutional resilience. In addition, the Covid-19 pandemic requires a holistic approach to meet the challenges. In this study, the goal of resilience to the outbreak of the epidemic is to develop an overall framework by identifying institutional departments to strengthen resilience planning. The framework can guide evidence-based decision-making and prioritisation. This article encapsulates a framework that focuses on the interactions between processes and their system characteristics, which leads to an overemphasis on a limited number of features, significantly enhancing the flexibility of the organisation. The result of this article, that it is critical to consider what lessons we have gained from previous situations and if they have been incorporated into policies and management practices. The emerging field of resilience assessment and management, as well as its implementation, could evaluate cross-domain alternatives to identify a policy design that improves the system's ability to (1) plan adverse events, (2) absorb stress, (3) recover, and (4) prevent and prepare for future stressors by appropriately adapting them.

SOcio-Economic Resilience of Pidie Jaya to Against Disaster in the Terms of National Security

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ABSTRACT

Pidie Jaya (Piday) District of Aceh Province is a newly formed district in 2007. In addition to the COVID-19 pandemic, the Pidie Jaya
district also experienced a series of disasters throughout 2020. Nevertheless, the Piday District Human Development Index (HDI) in 2017 exceeded the National achievement. But Piday district poverty ranks 3rd in the Province. This has the potential to make Piday district prone to disasters in addition to geographical location factors. Therefore, the existence of such gaps in this study will be discussed. This study uses qualitative methods through descriptive narrative approaches. Information and data were obtained through FGD from several sources and studies of some literature. The results stated that the gap is due to economic development is less evenly distributed and less felt by lower-level people. This is due to low education factors and lack of capital for farmers and fishermen as the majority of workers in Piday District. The research suggests increasing community capacity and resilience by improving the quality of human resources; infrastructure development; provision of capital and ease of access in business and insurance coverage against disasters; empowerment of the role and involvement of local community leaders in the formulation of policies.

THE IMPACTS OF THE POLICIES IMPLEMENTATION TO HANDLE THE COVID-19 PANDEMIC IN THE FIELD OF EMPLOYMENT

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ABSTRACT

The implementation of policies to handle the Covid-19 pandemic that has been taking place in Indonesia since the beginning of 2020 has resulted in various impacts, especially in the field of employment. This paper aims to analyze the positive and negative impacts of implementing those policies. This study uses a
qualitative method, where data collection was conducted through interviews. The implementation of pandemic-related policies in PT Freeport Indonesia was selected as a case study. The findings of this study indicate that related to employment issues, the positive and negative impacts of the implementation of the Covid-19 handling policy were felt to be most significant on the issues of Occupational Health and Safety (OHS) and income. As for social protection (insurance), employment contracts, and severance pay, the impact was relatively not felt by workers.

ICDMM-7067

MODEL SYSTEM DYNAMICS POTENTIAL IMPACT OF DISASTERS DUE TO THE RE-PERIOD OF THE OCTOBER 25, 2010 EARTHQUAKE IN THE MENTAWAI ISLANDS

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ABSTRACT

Geographically, the Mentawai Islands Regency has a territorial boundary with the sea. The north side is the Siberut Strait, the south side is bordered by the Indian Ocean, the east side is bordered by the Mentawai Strait, and the west side is bordered by the Indian Ocean. The Mentawai Islands Regency area has a high level of seismicity which makes it prone to earthquakes and tsunamis because it has an earthquake return period. Population and economic growth in the Mentawai Islands Regency continue to increase, resulting in a higher level of threat due to earthquakes and tsunamis to people and buildings in the Mentawai Islands. By using earthquake return period modeling based on secondary data and population and building growth modeling using system dynamics, Pentahelix can implement disaster risk mitigation in the Mentawai Islands Regency to reduce the risk of casualties and material losses. Based on the prediction that the Mentawai earthquake return period on October 25, 2010, will occur for 24
years to 57 years or around 2034 to 2067, and the results of system
dynamics modeling with Powersim Studio 10 software, the
number of vulnerable people affected is 24,764 people up to
42,944 people and potential losses. housing sector between
144.73 billion to 250.98 billion.

ICDMM-7077

POTENTIAL EARTHQUAKE AND TSUNAMI DISASTER IN
SULAWESI (LESSON LEARNED EARTHQUAKE SOUTH WEST)

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ABSTRACT

Earthquake and tsunami disasters always bring negative impacts
and losses for humans. The high frequency of earthquake
disasters in Sulawesi and the massive impact of destruction and
damage to infrastructure, loss of homes and property, and death
of people is partly due to the lack of knowledge of this potential
disaster by the surrounding community. Therefore, it is necessary
to study the potential for earthquake and tsunami disasters on
Sulawesi Island, and Lesson Learned about the Earthquake
Disaster that has occurred in West Sulawesi. Method: This study
uses a qualitative method with a descriptive analysis design of
secondary data obtained through a comprehensive literature
review. Result and Discussion: The results showed that Sulawesi
Island has a high potential for earthquake disasters, which in the
historical records of disasters, some of these earthquakes were
accompanied by tsunami waves. The lesson that can be drawn
from the earthquake in West Sulawesi is the potential for
aftershocks after the opening earthquake and the main
earthquake. In addition, the urgency of building earthquake-
resistant housing structural mitigation is the key to safety during
an earthquake. The post-earthquake recovery program in West
Sulawesi requires further studies related to soil classification surveys, soil dominant periods, and soil seismic vulnerability index, as part of rebuilding a better and safer post-disaster area.

ICDMM-7087

Balla Ewako: Community Response to the Covid-19 Pandemic Based on Local Wisdom

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Abstract

The Covid-19 pandemic has entered a new phase with the discovery of new variants from several countries entering Indonesia. This epidemic is capable of destroying the joints of people's lives, such as health, education, politics, economics, social, culture, politics to the point of disrupting regional resilience. Various efforts have been made by the government in the context of dealing with Covid-19 which cannot be ascertained to end. This research has the aim of analyzing the other side of the Covid-19 pandemic in the form of local wisdom. This study uses descriptive qualitative data obtained through interviews, observation, and documentation. The analytical technique used is the Miles, Huberman, and Saldana model. The results of this study indicate that the local wisdom of Balla Ewako has the meaning of a tough house in the face of the Covid-19 pandemic. Balla Ewako is a tough village program by the South Sulawesi Regional Police which later became a movement for the community in dealing with the Covid-19 pandemic based on local wisdom. The Balla Ewako program has the goal of a strong village for health, food resilience, and security with direct community involvement. Balla Ewako has proven to be effective in tackling the Covid-19 pandemic by mobilizing all elements of the grassroots community.
THE COVID-19 PANDEMIC IN THE PERSPECTIVE OF INDONESIA’S NATIONAL SECURITY

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ABSTRACT
The Corona Virus Diseases 2019 or Covid-19 is a worldwide issue that has become a significant health issue in Indonesia. Currently, in Indonesia, till June 27, 2021, the number of cases has reached 2,115,304, with 57,138 deaths and 1,850,481 healing. Every day the issues of Covid-19 tend to increase. The Covid-19 pandemic affects all sectors. It is the political, economic, socio-cultural, defense and security sectors. Generally, this study analyzes Covid-19 from the national security perspective, which one of the elements is human security. This study used a qualitative research method with a descriptive analysis approach to answering Covid-19 research problems from a national security perspective. This study indicated that Covid-19 impacts national security, military, political, economic, social, environmental, and human security. The government has released the regulations that arrange the community to mitigate the spread of Covid-19. The government has issued a vaccination policy to protect the public from Covid-19. The conclusion of this study, Covid-19 affects national security, both general security and human security. The entirety handling of Covid-19 will enhance the sense of security of each citizen, especially in terms of human security.
MONITORING AND ANALYSIS OF SEISMIC DATA DURING THE 2018 SUNDA STRAIT TSUNAMI

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ABSTRACT

The tsunami of Sunda Strait occurred on December 22, 2018, at 21:03 West Indonesia Time (zone). An eruption of Mount Anak Krakatau caused an eruption that triggered a landslide on the slopes of Mount Anak Krakatau covering an area of 64 hectares that hit the coastal area of western Banten and southern Lampung and resulted in 437 deaths, 14,059 people were injured, and 33,721 people were displaced. Before the tsunami, signal transmissions (gaps) at the Lava seismograph station installed on the body of Mount Anak Krakatau experienced broken so that Mount Anak Krakatau Observation Post could not record volcanic earthquake signals since December 22, 2018, at 21.03 West Indonesia Time (zone). Given these facts, proper monitoring and analysis were required to monitor and analyze the source of ground vibrations originating from the eruption of Mount Anak Krakatau. Therefore, these study aims to confirm the eruptive activity of Mount Anak Krakatau based on seismic monitoring and analysis sourced from the BMKG's seismic sensor network. The method author uses are by monitoring the seismic signal recorded by the seismometer and analyzing the seismic signal using the Seiscomp3 software. By the results of monitoring and analysis of seismic data, it was found that the location of the center of the ground shaking was on Mount Anak Krakatau with a magnitude of 3.4, and a depth of 1 km. The activity of non-tectonic seismic is originating from the eruption of Mount Anak Krakatau can be monitored by the BMKG seismic sensor station network, and the
non-tectonic seismic data can be analyzed using the Seiscomp3 software.

ICDMM-7117

PENTAHELIX SYNERGITY NATURAL AND NON NATURAL DISASTER MANAGEMENT IN PIDIE JAYA DISTRICT ACEH PROVINCE TO SUPPORT NATIONAL SECURITY

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ABSTRACT

Disasters that often occur in various places in Indonesia, including in Pidie Jaya, Aceh Province, have quite a big influence on various aspects of the socio-economic life of the affected communities as a result of Indonesia's geographical location with high disaster vulnerability, from natural disasters such as earthquakes, tsunamis, floods, landslides, volcanic eruptions and non-natural such as the Covid-19 Pandemic, maximum disaster management efforts will reduce disaster risk so that it will provide a sense of security and community resilience and can anticipate all the impacts of disasters caused, of course integrated collaboration in the form of the concept of Pentahelix Synergy involving elements of the Government, Society, Academics, the business world, the mass media and the private sector will provide great energy so that all disaster problems can be resolved properly and integrated with the active participation of all elements of Pentahelix in accordance with the capacities possessed by each complementary element.
COMPARISON OF AIR POLLUTANT STANDARD INDEX BEFORE AND DURING THE COVID-19 PANDEMIC IN DKI JAKARTA
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ABSTRACT
Clean air is a basic thing that is needed by living things. This makes clean air very important for the continuity of life. Therefore, an air pollution standard index is needed to determine air quality based on the concentration of gas contained in it. As the State Capital which is the center of the economy, DKI Jakarta Province has an important air quality issue that needs to be controlled regularly. This research is a qualitative descriptive study of secondary data on the air pollutant standard index with the aim of comparing the gas concentration parameters in the air before and during the Covid-19 pandemic. The results of the analysis show that during the Covid-19 pandemic there was an increase in the "good and moderate" category days and a decrease in the "unhealthy and very unhealthy" category days compared to before the Covid-19 pandemic.

DETERMINATION OF TSUNAMI RUN-UP AND GOLDEN TIME IN THE MEGATHRUST SUBDUCTION ZONE OF THE SUNDA STRAIT SEGMENT
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The Indonesian Disaster Data and Information Management Database states that the tsunami in the Megathrust Subduction Zone of the Sunda Strait Segment is a disaster threat with high impact and loss of life every time it occurs. Therefore, determining the run-up and golden time of the tsunami in the Megathrust Subduction Zone of the Sunda Strait Segment is absolutely necessary as part of the mitigation of seismic activity that has the potential for a tsunami. The design of this study is a qualitative research with primary data to determine the run-up and golden time of the tsunami in the Megathrust Subduction Zone of the Sunda Strait Segment obtained from the Indonesia Tsunami Warning System (InaTEWS) at BMKG. The results of the study inform that seismic activity in the Megathrust Subduction Zone of the Sunda Strait Segment can cause a tsunami with a run-up of 5.99 meters and a golden time of 40 minutes 19 seconds in Banten and South Lampung, run-up of 3.83 meters and a golden time of 1 hour 1 minute 10 seconds in Pacitan, East Java, run up 3.28 meters and golden time 33 minutes 15 seconds in Pangandaran, West Java.

NATURAL DISASTERS AND COVID-19: HEALTH WORKER PREPAREDNESS AND RESPONSE

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The number of natural disasters amid COVID-19 was increase. Qualified health workers are needed to handle the victim of disaster. The purpose of this study was to determine the preparedness of health workers individually and in the workplace to deal with natural disasters during COVID-19. Data collection was carried out by distributing online questionnaires through social
media with a total number of respondents, namely 79 health workers from Bandung Regency and outside Bandung Regency. The research questionnaire was adapted from the COVID-19 Preparedness Checklist for Rural Primary Health Care and Community Settings. During the COVID-19 pandemic, health workers' personal readiness to deal with natural disasters is still lacking. Primary health care and hospitals do not yet have adequate health facilities to deal with COVID-19, and in the case of a natural disaster, the situation will worsen.

ICDMM-7157

POSITIVE IMPACTS AMONG THE NEGATIVE IMPACTS OF THE COVID-19 PANDEMIC FOR COMMUNITY LIFE

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ABSTRACT

The Covid-19 pandemic has become a global disease outbreak that has spread in several countries in the world with a spread that is so fast and transmits from one person to another so easily and is a form of danger that has the potential to threaten all aspects of people's lives, the negative impacts include social, economic, health and psychological impacts, even to the point of threatening the defense and security of the country, this is due to the limited space for human movement in carrying out daily activities, but behind all this there is also a positive influence it has which we unconsciously acknowledge. It not only produces clean air, it also makes individuals mentally strong and changes their personalities towards a better life, adapting to new life patterns from before, making people learn about the meaning of maintaining cleanliness in the face of the Pandemic with new habits of maintaining personal hygiene, kelaurg a and the surrounding environment, the long-term impact on society, namely producing people who are tough in facing life by seeing and taking advantage of all the
opportunities that exist to become new innovations in carrying out daily life with the emergence of creative businesses as a new source of income for meet the needs of families today and in the future.

ICDMM-7167

LESSON LEARN EARTHQUAKE DISASTER IN PIDIE JAYA ACEH IN 2016 TO REALIZE A DISASTER RESISTENT COMMUNITY

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ABSTRACT

Indirectly, to protect and achieve prosperity, national security is needed as a form of freedom for the state, society and citizens from all forms of threats. Natural disasters are one of non-military threat that is very real in the territory of the Unitary State of the Republic of Indonesia. Casualties, economic, social, environmental damage, and psychological impacts caused by the disaster are real conditions that occur as a result of this non-military threat. Geographical position allows the threat of natural disasters due to movement of tectonic plates and volcanic activity. This is a natural event that always occurs in the cycle of life on earth. After an earthquake measuring 9.1 magnitude with a giant tsunami wave that devastated the city of Banda Aceh, Aceh Province on December 26, 2004. On Wednesday December 7, 2016, at 05.03.36 am., an earthquake measuring 6.5 magnitude occurred again which rocked the Pidie Jaya Regency area, Aceh Province. The methodology used in this research is a qualitative method with data collection techniques, namely interview, observation, and document studies. The results of this research is to make the earthquake in Pidie Jaya District in 2016 as a Lesson Learn for all parties, especially in Pidie Jaya District and in general, for all Indonesian people to form disaster resilient communities.
who have awareness of the potential disasters that will be faced in order to contribute to the condition of National Security.

ICDMM-1317

CAPABILITIES OF THE CITY GOVERNMENT IN COMBATING COVID-19 IN THE CITY OF PADANG

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ABSTRACT

The purpose of this research is to explain the capability of the Padang city government in dealing with Covid-19, where Padang City is one of the cities in West Sumatra whose level of spread of Covid-19 is quite worrying. This is based on the increase in the number of Covid-19 cases in the city of Padang when the New Normal policy began to be implemented. The low awareness of the community to implement health protocols is considered one of the factors for the soaring positive case of Covid-19 in the city of Padang. The theory that I use in this research is Disaster Management and Local Government Capability by Bevaola Kusumasari. The data collection method is qualitative, in the form of interviews and documentation. The results of this study indicate that the capability of the Padang City government in dealing with Covid-19 shows that the City of Padang has the ability to suppress the rate of positive Covid-19 numbers. However, Padang City is still weak in terms of law enforcement in dealing with Covid-19, because there are still people who violate health protocols.

ICDMM-1417

A STUDY ON THE USE OF PUBLIC TRANSPORTATION DURING THE COVID-19 PANDEMIC

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ABSTRACT
During the Covid-19 pandemic, public transportation occupancy has decreased significantly. In addition to the sluggish economy, the Covid-19 health protocol rules require that only 50 percent of passengers can be transported for public transportation. This study tries to identify the use of public transportation and the factors that influence this use during the adaptation period for the new habits of the Covid-19 pandemic. Data on the frequency of using public transportation before and during the pandemic was processed with the index formula. Before the pandemic period, using public transportation was quite frequent, with an index value 60.8%. During the pandemic period, 10.1% of respondents did not do activities outside the home. Respondents who moved outside their homes (89.9%) used private vehicles (88.3%) and 11.7% public transportation for their trips. The type of public transportation often used is online transportation (motorbike and car) by 62.1%. The frequency of use of public transportation is rare (44.9%) and very rarely (40.8%); the rest are often (9.7%) and very often (4.5%). This value will produce an index value of 44.5% with a sparse interval interpretation. A hypothesis test was conducted between the respondent's characteristics (gender, age, occupation, and vehicle ownership) and the frequency of using public transportation. The result shows that the factor influencing the frequency of using public transportation is the respondent's occupation.
ABSTRACT
As of June 30, 2021, Indonesia ranks third in Asia with the highest number of deaths due to COVID-19. One of the provinces in Indonesia, Central Java, is ranked third nationally in the accumulation of positive cases, recoveries, and deaths. Fulfilling the need for burial grounds for COVID-19 positive bodies needs attention because several countries and regions in Indonesia were experiencing a COVID-19 public cemetery land crisis. Sragen Regency is one area in Central Java designated as a red zone. The number of death cases is relatively high needs to ensure the availability of COVID-19 burial grounds. Therefore, this study aims to model the forecast for COVID-19 burial grounds. The approach used in this research is systems thinking, while the method used is a system dynamics with Powersim software. Reference data for modeling is obtained from the http://corona.sragenkab.go.id page. The simulation results show the AME value of 4.7% or less than 5% so that the model is declared valid. Based on the Business as Usual (BAU) simulation, in the 20th week, it is estimated that there will be 320 deaths with a burial area of 961.13 m². Until the 20th week, the increase in COVID-19 Positive Population, Death, and Cemetery Land Needs on the graph of the BAU simulation results shows an exponential growth trend.

METAL CRACKS DETECTION BASED ON CIRCULAR PATCH MICROSTRIP ANTENNA
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ABSTRACT
Cracks in metal can be produced by many factors, such as external loads, physical processes, and chemical processes, such as alkali and corrosion. Structure health monitoring (SHM) is very
important in maintaining the reliability of a building. Considering
that the ultimate goal of a building health monitoring system is to
provide sensory information that can facilitate decision making
regarding the feasibility of components. Microstrip antennas have
been shown to be able to detect cracking in metals according to
their characteristics. In this paper will discuss the capability of a
microstrip antenna with a circular patch having dual frequency
operation to detect crack in metal.

ICDMM-2317

ANALYSIS OF CAPACITY COMMUNITY LEVEL IN VARIOUS
POTENTIAL DISASTERS AT DINOYO AND SUKUN SUB-
DISTRICT, MALANG CITY

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ABSTRACT

The natural disaster in pandemic covid-19 will still ongoing in East
Java, Indonesia. Apart from the virus pandemic, there are still
several potential disasters in the that sub-district, namely floods
and landslides. Many disasters have occurred resulting in the need
for people living in the area to anticipate, especially if the three
disasters occur simultaneously. In Malang this case of sub-district
apparatus and the BPBD Malang City has not been able to
optimally help restore the condition of the community due to the
complexity of conditions that occur in the field. Therefore, the
community needs to know their capacity to be able to anticipate if
it is two or three will be happen. Capacity is a combination of all
the forces that exist in a community, social or organizational group
that can reduce the impact of a disaster risk or impact (UN-ISDR,
The capacity assessment in this study identifies the capitals owned by the community. These capitals include natural, human, physical, financial and social capital. The five capitals will later be described in the pentagon assets, so that it will be known which capacities in capital are the strengths and weaknesses of the people of Dinoyo and Sukun sub-district.

THE EFFECTIVENESS OF THE NON-FREE PLASTIC BAG POLICY TO REDUCE PLASTIC WASTE IN THE COMMUNITY OF PADANG

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ABSTRACT
The waste generation of Padang City at the Final Processing Site (TPA) is 495.50 tons/day, and the amount of unmanaged waste is 62.42 tons/day, of which 40% is plastic waste. Efforts to reduce the use of plastic bags have begun in Padang, referring to Perwaliko number 36 of 2018. Shopping centers and modern stores must use plastic shopping bags that meet SNI no later than December 31, 2020, especially in various retail and contemporary shopping centers. This study aimed to analyze the relationship between the effectiveness of plastic use policies and the decrease in the use of plastic bags in people who shop at modern retailers in Padang City. This type of research is quantitative with a cross-sectional design. The number of samples is 116 respondents who shop at modern shopping centers, namely Matahari Dept. Store, Food Mart Padang, Ramayana Padang and SPAR Padang. Data analysis used univariate and bivariate analysis. The results showed that 46.6% of respondents stated that the plastic bag policy was not adequate, and 46.6% of respondents stated that there was no reduction in plastic bags. There is a significant relationship between the effectiveness of the plastic bag policy and the decrease in the use
of plastic bags in the people of Padang City (p=0.029). With this paid plastic bag policy, government, retailers, and the public will be more concerned with the environment.

ICDMM-5229

STUDY OF THE EFFECTS OF CHECK DAM CONSTRUCTION ON THE LIMAU MANIH RIVER USING GIS

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ABSTRACT

The problem of flooding or flash floods in watersheds often occurs, both in large rivers and small rivers. The frequency of occurrence varies greatly depending on the local climate. As a result of flooding, it causes more erosion and collapse of riverbanks and washes away all kinds of materials, such as wood, sand and stone. Sometimes it also submerges rice fields, villages and houses downstream of the river. Likewise, in the study location of the Limau Manih river, there has been a flood with a large discharge. It was recorded twice in a year, namely in July and September 2012. One of the ways to reduce energy, scour and avalanches on riverbanks is by building a check dam or weir. Check dam is expected to reduce the energy that arises due to differences in elevation or slope of the river channel. But on the other hand the weir will raise the water level, so that the puddle becomes wider. Therefore, it is necessary to study the impact of weir construction on the extent of inundation. The study was conducted using ArcGIS to map inundation and HEC-RAS to simulate water level along the river. Simulations were carried out for several return periods of rainfall events. The results of the study show that the planned flood discharge in the river of Limau Manih watershed is quite large. Meanwhile, from the simulation results, the inundation area is not too significant with the increase in the return period and the
planned flood discharge. Although the simulation of the weir without widening the upstream part of the weir shows a significant increase in inundation area. This is most likely due to the weir in the upstream area of the river which is rather steep, so that water flows quickly through the overflow of the weir. For this reason, it is very necessary to monitor the scour behavior in the weir and the sedimentation rate, because this area has the potential to be eroded.

ICDMM-2717

RISK ANALYSIS OF PRODUCTION PROCESS FOR FOOD SMES USING FMEA METHOD: A CASE STUDY

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ABSTRACT
The increasing development of the industry makes every industry have to compete with other competitors to gain an edge. The advantages of competition are influenced by several factors, one of which is good human resource management. Where if a company has good human resources it will increase profits indirectly and can increase productivity. This research discusses case studies about the potential dangers of what is contained in IKM Heppy Bakery that can harm workers in doing bread production. The purpose of this study is to find out what are the most influential hazard factors on the bread production process and provide solutions to these hazards. The method used is Failure Mode and Effect Analysis (FMEA) method where later the data will be filled and given a rating that is distinguished in 3 parts including severity, occurrence, and detection. The data was obtained through questionnaires given to 3 workers at IKM Heppy Bakery and filled in rating values based on the provisions that have been given to the questionnaire. This value is useful for determining the RPN obtained from multiplication between severity, occurrence, and detection. After processing the data of RPN multiplication
results obtained that the highest RPN value obtained by 193 with the danger factor of the operator overheated and dehydrated due to high temperatures. Furthermore, the calculation of critical value obtained by 109. Based on the critical value obtained there are 7 hazard factors that are above the critical value so that these seven hazard factors need to be improved so that workers do not avoid accidents when conducting the production process.

COVID-19 PANDEMIC CONDITIONS: THE ROLE OF SUSTAINABLE ENVIRONMENT IN INTENTIONS TO GIVE ZAKAT, INFAQ, AND SADAQAH

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ABSTRACT
The purpose of this paper is to determine the factors that influence the intention to give zakat, infaq, and sadaqah of Indonesian Muslim communities using the Theory of Planned Behavior (TPB) model. The sample data used in this study were 128 respondents and processed with SPSS to test the significance of the regression model. The independent variables used are religious beliefs, attitudes, subjective norms, and perceived behavioral control, while intention is the dependent variable. The results showed that the idea of a sustainable environment had a positive and significant effect on attitudes. In addition, attitudes, subjective norms, and perceived behavioral control also have a positive and significant impact on intentions to the surrounding community. Amil institutions can predict the behavior of muzak through this paper. As for academics, this paper is used for further research by integrating perceived behavioral control as a predictor of Indonesian Muslim intentions. This study is an initial study that investigates the determinants of muzak behavior through the TPB model. Therefore, this paper will be helpful to a contribution from
academics regarding the behavior Muslim community in the conditions COVID-19 pandemic in Indonesia and the world.

ICDMM-2827

OPTIMIZATION OF LAND USE TO REDUCE SURFACE FLOWS AND EROSION IN KURANJI WATERSHED

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ABSTRACT

Changes in land cover in the Kuranji watershed (22,460 ha) increased very rapidly along with the increase in the number of people using land due to the impact of the September 2009 earthquake. The impact on the increase in surface runoff and soil erosion. Therefore, an appropriate land use model is needed so that surface runoff and erosion can be reduced. This study aims to determine the value of surface runoff using rational methods and soil erosion using a modified universal soil loss equation model based on land units with a total sample of 22 samples. Furthermore, land units that produce erosion and exceed the tolerance limit are analyzed using a land cover change scenario using a multi-criteria spatial analysis model. Scenario determination is also based on maps of conservation, protected areas and cultivation as well as the spatial plan of Padang City. The results showed that erosion that exceeded the tolerance limit was found in 5 samples. Sample 2 mixed gardens with a very steep slope of 16.60 tons/ha/year, sample 9 settlements with a slightly steep slope of 12.53 tons/ha/year, sample 14 mixed gardens with a steep slope of 8.57 tons/ha/year, sample 14 mixed gardens with a steep slope of 8.57 tons/ha/year, sample 14 mixed gardens with a steep slope of 8.57 tons/ha/year. 19 settlements with a flat slope of 19.43 tons/ha/year, and sample 21 settlements with a flat slope of 17.85 tons/ha/year. The plan to reduce erosion is to convert 0.83% of shrubs and 4.51% of mixed gardens located in
conservation and protected areas into forest. Thus, erosion can be reduced by up to 70-80 percent. In mixed garden areas the density increases and in residential areas there is no change in land use because settlements are permanent.

ICDMM-2837

ESTABLISHING TSUNAMI HAZARD ZONE IN PASIR JAMBAK SUB-DISTRICT, IN PADANG, INDONESIA

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ABSTRACT
A tsunami hazard is an adverse event that causes damage to properties and loss of life. The problem in assessing a tsunami risk zone for a small area is significant, as available tsunami inundation zone data does not give detailed information for tsunami inundation and run-up in every nested grid. Hence, the aim of this study is to establish a tsunami risk zone in a small area, in a study area site. Here, the study area is in the Pasir Jambak sub-district in Padang, Indonesia. The map was carried out in every nested grid point of the area and on a large scale (1:5,000). The first step of this study is to determine some parameters for tsunami simulations. Tsunami assessment was made through simulations in nine scenarios of fault parameter data for Sipora block earthquakes. The second step of this result is to provide a map. The map includes more detailed information for tsunami inundation and run-up in every nested grid and on a large scale. Furthermore, this tsunami inundation map can be used for communities, local authorities, government, and others for many studies, and decision-makers can come up with mitigation plans for a small study area.
“MONSTER VIPS”: DISASTER PREPAREDNESS TRAINING FOR CHILDREN WITH INTELLECTUAL DISABILITIES

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ABSTRACT

Disaster resilience is vital to everyone, including people with disabilities. However, teaching people with disabilities requires special techniques, and there is scant literature in the area. This case study designs and implements disaster preparedness training at a school for children with intellectual disabilities in Padang, Indonesia, an area prone to earthquakes and tsunamis. The training utilizes a blended learning approach called ‘Monster VIPs’ that combines various learning methods such as storytelling, posters, videos, puzzles, and disaster simulations to facilitate students to understand disasters responses. The training involves university teachers and disaster preparedness volunteers (Taruna Siaga Bencana/TAGANA) of the city’s social services.

POST DISASTER RECONSTRUCTION RESPONSIVE GENDER IN WEST SUMATRA

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ABSTRACT
The frequency of natural disasters that occur in Indonesia is quite high, ranging from earthquakes, tsunamis, floods, landslides, forest fires, and volcanic eruptions, disasters that are directly caused by human activities. Some of the disasters that occurred in Indonesia were small in scale, but many were very large and powerful, such as the tsunami in Nangroe Aceh Darussalam, the tectonic earthquake in the Special Region of Yogyakarta, and 30 September 2009 earthquake in west sumatera. The tsunami and earthquake disasters caused enormous damage to property and infrastructure as well as loss of life. Conditions like this require Indonesia to develop and have special policies to deal with or deal with natural disasters properly. If not, then the losses or victims due to natural disasters will be greater. An earthquake on September 30, 2009 measuring 7.9 on the Richter scale struck the west coast of Sumatra, causing loss of life and damage to infrastructure. Most of the victims occurred on the island of Sumatra, especially Aceh and West Sumatra. There were 1,115 killed, 1,214 seriously injured and 1,688 lightly injured. One of the important elements in efforts to build a natural disaster management system is to evaluate and take important lessons from the activities or systems for natural disaster management that have been carried out so far. Strengths and successes as well as weaknesses and failures in natural disaster management that have been carried out will be important lessons for building a better national system for natural disaster management in the future. Therefore, A comprehensive study of natural disaster management activities or systems should be used as learning materials to form a disaster management system. Disaster preparedness by minimizing vulnerability has been identified as a better approach to dealing with disasters than post-disaster response. Creating a culture of prevention is critical to dealing with everyday hazards and the consequences of disasters. Disaster risk reduction is defined as a conceptual framework, which considers the possibility of minimizing the vulnerability and risk of disasters.
throughout society, to avoid (prevention) or to limit (mitigation and preparedness) harm. Starting from the availability of shelters that are not safe and in accordance with the needs, especially groups of women and children, the location of the shelters is far from their initial residence. Likewise, the distribution of disaster aid has not taken into account the special needs of this group of women and children. Knowing how the gender effectiveness on reconstruction post-disaster in West Sumatra region, from the data of natural disaster in west sumatera, and collecting data from the field from people who closed related to the process of reconstruction post disasters in west sumatera. This study aims to obtain an accurate description of the gender position in reconstruction post-disaster activities in West Sumatra.

MANAGING POLICIES FOR STUNTING PREVENTION DURING THE COVID-19 DISASTER: THE CASE OF WEST SUMATRA PROVINCE

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ABSTRACT

The Covid-19 pandemic has had major implications for government administration. Policy makers set policies for handling Covid-19 as a priority agenda at this time. However, these measures have reduced other problems such as stunting which still requires government attention. This article explores policy
management of stunting by the local government amid Covid-19 pandemic with West Sumatra province case. From the findings in the field, it shows that the implementation of stunting prevention policies is not easy considering the powerlessness caused by budget refocusing and overlapping authorities between institutions. Meanwhile, the meaninglessness is indicated by the low level of public support for the handling of stunting. This is exacerbated by a bureaucratic culture that is slow to implement policies, including in managing stunting-related programs during the Covid-19 crisis. Thus, there is alienation or what we term as alienation in the bureaucracy in implementing stunting prevention policies. In the end, the management of stunting policies during the Covid-19 pandemic should receive strong support from all involved parties.

ICDMM-128

ACCELERATING INFORMATION OF TSUNAMI DISASTER USING EARLY WARNING SYSTEM (EWS) DEVICES: SMART SOLUTION FOR COMMUNICATION, NAVIGATION AND SURVEILLANCE DUE TO TIDAL SEA LEVEL

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ABSTRACT
One of the important aspects in reducing Tsunami Risk is understanding Natural Hazards. The loss of INA TEWS equipment worth hundreds of billions of rupiah and the occurrence of the Tsunami in Aceh and other parts of Indonesia are warnings that our society needs the help of effective early warning tools at affordable prices. Using this device will make it easier for the community to monitor natural events from the field and reduce
disaster risk. Currently the government has purchased hundreds units of JRC-UNESCO products, namely IDSL (Inexpensive Device for Sea Level), but this device takes 21 minutes of information to reach the community. Therefore, a new device that has been prepared is needed. (FIDELA EARLY WARNING SYSTEM/FEWS) is a tool that involves the Equipment sector, Operations sector and Community sector. The expected result of this device is that the time for sending information to the public is only 5 minutes.

STRENGTHENING SOCIAL CAPITAL OF URBAN COMMUNITY DURING COVID-19 DISASTER

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ABSTRACT

COVID-19 disaster has destroyed many facets of societal and economic circumstances. However, it remains a crucial debate how the effect of COVID-19 on community social capital. This study aims to examine the relationship between a community’s risk perception on COVID-19 and social capital. In addition, we also investigate the mediating role of social collectivism in the association. This research used a survey approach by performing
an online questionnaire. Data were gathered from 156 respondents at the residence in an urban community in Sukoharjo, Central Java. A partial-least square structural equation modelling (PLS-SEM) was applied to analyse the data. The results show that social capital enhances during COVID 19 because of the increasing risk perceptions on COVID-19 and social collectivism. The impact of risk perceptions on social capital is mediated by social collectivism. The present study adds our understanding of social capital at the time of the COVID-19 outbreak, especially what factors drive it. The research also has practical implications for the government and urban community to anticipate risks of COVID-19 by enhancing social capital and collectivism.

ICDMM-148

ROLE OF MEDIA IN DISASTER PREPAREDNESS: SOME CASE STUDIES FROM CALAMITY PRONE ODISHA

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ABSTRACT
Odisha is a natural disaster prone state. Its geographical location contributes a lot for the disasters. The eastern Indian state has a 480 Kilometre long coastline. The Bay of Bengal which is the house of cyclonic storms is the major contributor for the calamities in the state. From time immemorial till today Odisha has been facing hundreds of calamities in the form of cyclones, floods and famines. It is a regular phenomenon that in the period of September to December every year Odisha faces varieties of cyclones. These affect human life, properties and agriculture to the maximum extent. After the super cyclone of 1999 the government became sensitive so also the media. In these two decades Odisha media has played a vital role in creating awareness about the disasters and helped people in displacement and rehabilitation. In recent pasts media helped the Government in reaching the “Zero Casualty” target. The role of media not only limited to this, even
post-disasters it followed the condition of people and their lives. The researcher takes some case studies of different disasters and their handling by media. Also tries to find out the people’s perception about media in disaster preparedness and management.

ICDMM-158

A LITERATURE REVIEW: MODEL OF DISASTER RISK REDUCTION FOR DECISION SUPPORT SYSTEM

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ABSTRACT
Disaster is a threat to human life. Many losses are caused by disasters, namely loss of life, injured people, loss of homes, and others. In addition, the frequency and intensity of disasters are also increasing every year. Therefore, research on Disaster Risk Reduction (DRR) is needed both to reduce disaster risk and to manage the disaster. The purpose of this research is to develop an appropriate DRR model in an area to assist decision-making in making policy. This research was compiled based on literature studies from various reputable journals to be used as a reference in the preparation of the right model. Then proceed with the development of a framework to model an efficient and effective DRR. The steps for making a holistic DRR model have been identified and the test design for the model has been determined, namely simulation, validation, and scenario. The recommendation given from this study is the preparation of a DSS (Decision Support System) as a tool for decision-makers to make policies regarding DRR-based regional development. This discussion will be continued in the next research by including case studies in certain urban areas.
THE EFFECT OF LAND USES CHANGE ON INFILTRATION CAPACITY AND SURFACE RUNOFF AT LATUNG SUB WATERSHED, PADANG CITY INDONESIA

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ABSTRACT
Changes in land use in the Air Dingin watershed (DAS) area in Padang City, Indonesia, leads to a decrease in rainwater infiltration volume to the ground. Furthermore, due to these changes, some land use in the Latung sub-watershed decrease in infiltration capacity with an increase in surface runoff. Therefore, this research aims to determine the effect of land-use changes on infiltration capacity and surface runoff. This is a survey research with the purposive sampling method used to determine each land use. The infiltration capacity was measured directly in the field using a double-ring infiltrometer, and the data was processed using the Horton model. The obtained capacity was quantitatively classified using infiltration zoning. Meanwhile, the Hydrologic Engineering Center - Hydrology Modeling System with the Synthetic Unit Hydrograph- Soil Conservation Service - Curve Number method was used to analyze the runoff discharge. The results showed that from the 13 measurement points carried out, the infiltration capacity ranges from 0.082 - 0.70 cm/minute or an average of 0.398 cm/minute, while the rainwater volume is approximately 150,000 m3/hour/km2. Therefore, the soil infiltration capacity in the Latung sub-watershed is in zone VI-B or very low. This condition had an impact on changes in runoff
discharge in this area, from 87.84 m³/second in 2010 to 112.8 m³/second in 2020 or a nail of 22.13%. Based on the results, it is concluded that changes in the land led to low soil infiltration capacity, thereby leading to an increase in surface runoff. Key word: Land use, infiltration, runoff, Watershed.

ICDMM-328

REMOVAL OF NITRATE USING MODIFIED PUMICE AS ADSORBENT FOR REDUCING GROUNDWATER POLLUTION

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ABSTRACT

Nitrate adsorption onto the physically and chemically modified pumice was investigated as an effort for reducing groundwater pollution. The treatments were heating at temperatures of 300°C, 450°C, and 600°C for physical and soaking in acid solutions (HCl, H₂SO₄, and HNO₃) for chemical treatments. The adsorption was performed in a batch system at room temperature (25±1°C) with the optimum condition (pH 4; 0.3 g/L of adsorbent dose; <63 µm of adsorbent diameters and 30 minutes of contact time). The results indicated that the physically and chemically modified pumice resulted in increasing removal efficiency and nitrate uptake compared to the natural pumice. The highest removal efficiency and nitrate uptake were achieved from 300°C of heating temperatures (62.04% and 155.09 mg/g) and H₂SO₄ for the acid solution (83.30% and 208.25 mg/g), while by using the natural pumice only reached 57.02 % and 142.55 mg/g. The SEM images of the modified pumice confirmed the change in the surface morphology of pumice including the pore structure and surface area which can be proper sites for adsorption of pollutants. This study demonstrated that physical and chemical modification could be the potential treatment to increase the removal efficiency and nitrate uptake of the natural pumice, thus can solve the problem of groundwater pollution.
THE EFFECTS OF RIVER NORMALIZATION ON FLOOD RISK
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ABSTRACT
A river is a naturally occurring flow system that flows from upstream to downstream. Rivers have many benefits. Similarly, rivers have a negative impact if rainfall is high. It can lead to catastrophic flooding. Flooding often occurs along the central roads of Padang City when it rains, especially in the Maransi and Aie Pacah areas. The purpose of this study is to estimate the height of water level by using software HEC – RAS and estimate areas that have the potential for flooding in conditions before and after river normalization by using the software Arc-GIS. Data collection is carried out to achieve this goal, namely the maximum daily rainfall data, Digital Elevation Model (DEM) data obtained from the processing of aerial photo data and cross-sectional data of river. Then, a numerical simulation is performed to estimate the height of the water level, and then a numerical simulation is performed to determine the extent of the flood area. The results of this study are in the form of flood area in conditions before and after river normalization with a period of 25, 50 and 100 years that can be used to see the effectiveness of river normalization work in river.

OPTIMIZING A MODIFIED TRIAXIAL TESTING FOR SMALL STRAIN ZONE USING LOCAL DISPLACEMENT TRANSDUCERS AND BENDER ELEMENT FOR CEMENT TREATED SOFT SOIL
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ABSTRACT
The settlement behavior is a common problem on the railway structure that can be optimized by applying cement treated soil as the ground improvement. However, the application of a high cement mixing content needs a proper estimation that can be achieved by applying the element testing. The strain measurement devices can estimate the deformation characteristics, such as Secant Modulus, Poisson Ratio, and Shear Modulus that can describe the settlement behavior and stiffness of cement treated soil. This research is focused on a static analysis of triaxial consolidated undrained (CU) testing that is improved by the axial and radial local displacement transducer (LDT) and bender element to increase the accuracy of measurement results. Furthermore, the Secant Modulus and Shear Modulus is more accurate when the combination of radial and axial LDT is used due to a small strain range. Lastly, the Shear Modulus measurement is improved using a filler in the cement treated soil for the bender element test. To conclude, this system of testing for the static condition can be utilized for the dynamic condition, because the measurement shows a reliable result for a small strain range which is the parameter of the dynamic condition.

MODELING SO2¬ DEGASSING OF THE 1990-1992 UNREST IN MERAPI VOLCANO USING TELEMETRIC MONITORING DATA
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ABSTRACT
Development of volcanic gas monitoring based telemetry have significant influence in forecasting volcanic eruptions. Monitoring of Geochemical Gas at Merapi Volcano began in 1990 using the Correlation Spectrometer (COSPEC) monitoring tool. The main purpose of this research is to develop an investigation of gas chemical anomalies of Merapi Volcano during the installation of the COSPEC monitoring system. The research method used in this study were Time Series Analysis during periods of unrest in 1990-1992. The research variables used in this study were data of monthly SO2 and daily SO2, Lava Dome Volume, and Multi-Phase events in Merapi volcano. The result of this research is the modeling of gas discharge as precursor of 1990 phreatic eruption and 1992 magmatic eruption based on time series analysis. The modeling is derived from the indicative relationship between the monthly SO2 data anomalies and the growth of the lava dome before the 1990 phreatic eruption, as well as the indicative relationship between the Daily SO2 data anomalies and seismic precursors before the 1992 magmatic eruption of Merapi volcano during periods of unrest.

ICDMM-2718

EFFECT OF LOAD ON THE SHAPE OF THE SLIP SURFACE AND THE VELOCITY OF THE LANDSLIDE ON A MIXTURE OF CLAY SAND

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ABSTRACT
The slip surface has an essential role in slope stability analysis. The slip surface is to be known to calculate the safety factor. The velocity of landslides needs to be done to mitigate when a landslide occurs to reduce the risk. This study is here to determine
the shape of the slip surface and the velocity of the landslide with variations in load and 2 combination material. The slope is formed in a glass box measuring 110 x10x40 cm. The slope angle used is the same as the angle of internal friction. The slope is given a uniform load until the slope collapses. Loading is done by using a pressure device placed on the proving ring at the bottom of the press. From both material variations and load variations, it can be seen that the shape of the slip surface that occurs is almost the same, namely in the form of a slip surface. So it is concluded that the load does not affect the shape of the slip surface. The velocity that occurs in combination 1 is moderate-rapid, while combination 2 is moderate. Combination 2 clay is safer than combination 1 but not too significant.

ICDMM-2039

PRACTICAL APPLICATIONS OF POTENTIAL LIQUEFACTION METHOD BASED ON GRAIN SIZE AND RELATIVE DENSITY

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ABSTRACT

Liquefaction potential analysis is a challenging field of study since it deals with uncertainty in earthquake science. However, the use of simple analytical methods to estimate the liquefaction potential will be a preferred choice for practitioner. Fortunately, there has been a lot of previous data showing that loose sand that is saturated with groundwater has been often or easily liquefied. The physical properties of sand that mostly affect the liquefaction resistance are the density and grain size. The denser the sand layers are more difficult to liquefy. The finer the grain size is the easier to liquefy. Both parameter together with the acceleration of the ground motion has been compiled to give a practical liquefaction potential analysis. This paper describes the application of liquefaction potential analysis based on its relative density and average grain size method. The method has been
widely applied and the results are satisfactory in terms of determining the liquefaction potential for several levels of earthquake acceleration.

SOIL CLASSIFICATION AT MUARO BARU BEACH OF PADANG CITY USING CPT DATA

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ABSTRACT

Many semi-empiric correlations have been developed to estimate geotechnical parameters based on Cone Penetration Test (CPT) data for various types of soils. This paper aims to classify soil types based on CPT data and compare the results with a laboratory test. In this study, the field CPT and the laboratory test were carried out on soil from two points in the estuary area of Muara Baru, Padang city in Indonesia. The CPT data was used to determine the soil type using non-normalized CPT Soil Behaviour Type (SBT) data based on the cone resistance and sleeve friction according to the method of Robertson et al. (1986) then updated by Robertson in 2010. The Unified Soil Classification System (USCS) be used for soil classification using a sieve analysis test. The results showed that the two methods gave compatible results for samples from the Muaro Baru beach of Padang City.
A Nursing Faculty building of Andalas University was constructed in 2013, which will be used as an office and meeting room in this faculty. Unfortunately, during the construction period, the concrete quality was found to be less than required in the Detail Engineering Design (DED), which is $fc'=14.32\ MPa$, so the construction could not be continued because it was not in accordance with the DED, that is $fc'=22.39\ MPa$. Therefore, it is necessary to evaluate the structural capacity of the building. Based on the evaluation results of the existing structure, it was found that the building has not enough capacity to resist the loads acting on the structure. Therefore, the building should be retrofitted with two alternative methods, First, by re-designing the building in which the existing columns will be strengthened using the concrete Jacketing and the second, by re-designing the building, where the existing columns will be demolished and then constructing the columns according to the results of the re-designed building. Analysis results of the retrofitted building show that the building structure has a strong enough capacity to carry the working loads and the performance of the building meets the requirements in Indonesian building standards, especially the seismic code SNI 1729 2019.

ICDMM-2029

EFFECT OF TSUNAMI LOADS ON THE ELEMENTARY SCHOOL BUILDING 23/24 PADANG, INDONESIA

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ABSTRACT

Indonesia is a country that is prone to natural disasters due to the geographical location of Indonesia, which is located between two large oceans and is located in the area of tectonic plates. Indonesia is located on a tectonic plate or is also included in the ring of fire, which means that Indonesia is prone to earthquakes and can cause tsunamis. The city of Padang is an area included in the
category of earthquake and tsunami-prone disasters because the island of Sumatra, especially the western part, is included in the ring of fire. Therefore, the buildings in areas located in disaster-prone zones must have certain technical engineering that is able to anticipate damage and collapse of buildings due to the earthquake and tsunami. Unfortunately, some buildings, including public school buildings in Padang city, were not designed to resist tsunami loads, with the reasons from the design consultant because there is no Indonesian standard for tsunami resistant buildings. This paper presents an analytical study to investigate the effect of Tsunami loads on a public School building in Padang City (Elementary School Building 23/24 Padang) based on the Indonesian Earthquake Standard SNI 1726-2019 SNI and FEMA P646-2019. The results show that the school building is strong against the earthquake loads, but it did not have enough capacity to resist the additional tsunami loads.
the liquefaction potential, the upper structure was designed to consider the earthquake load and tsunami waves according to FEMA P-464 (2012). Afterward, design the foundation dimensions based on the ultimate load from the upper structure, wherein the amount of the settlement should be smaller than the tolerable soil settlement. The method used in the paper is taking the CPT data in the Air Tawar Estuary. After analyzing the liquefaction potential, making an upper structure design with ETABS 2016, recapitulate the maximum joint reaction to design the foundation that can withstand the ultimate load, and calculate the amount of soil settlement. Thus the design of the upper structure and lower structure take into account liquefaction. The amount of soil settlement obtained in the building design is still within the tolerance range of 9.79 mm, where the maximum limit of reduction is 32 mm.

IMPLEMENTATION EMPOWERING COMMUNITIES IN SMALL SCALE RAILWAY PROJECTS DURING PANDEMI COVID 19 IN WEST SUMATRA

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ABSTRACT

The people's purchasing power decreased due to the covid 19 pandemic. Development, and economic growth were hampered. To overcome this, the government implement PKT (Cash for work) Program in Railway Projects. This program empowering the community in one way to recovery community income due to the covid pandemic 19. This article presents the implementation of PKT (Cash for work) Program in Railway Projects as an implementation of community-based engagement in empowering communities. There were five railway project investigated. This
research uses a literature review method to describe PKT program in Railways projects in West Sumatra. Descriptive statistics are used to identify the benefits of the programs for the community and the covid 19 protocol performed during project work. The results of the study were that, although the covid 19 protocol was not fully implemented, the program is useful in recovering the community income during the covid 19 pandemics.

ICDMM-2129

SPATIAL MODEL OF LAND SUBSIDENCE MITIGATION AT LOWLAND AREA

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ABSTRACT

South Sumatra is one of the provinces with a large number of lowlands in Indonesia consisting of tidal land and lowland swamps, one of which is located in Tanjung Api-Api. The conversion of lowlands into built-up areas will cause physical, socio-economic, environmental, and public health impacts. One of the impacts arising from the development of settlements and infrastructure in lowland areas is land subsidence and flooding. To reduce the impact of land subsidence, it is necessary to carry out disaster mitigation efforts. The purpose of this research is to create a model for mitigating land subsidence in lowland areas conceptually and spatially. Conceptual modeling is carried out based on a literature review and existing regulations, while the spatial model is carried out by weighting with AHP (Analytical Hierarchy Processes) and then mapping mitigation efforts that will be carried out based on the potential for land subsidence. The results show that if the lowland area is developed into an industrial and residential area, it will have an impact on land subsidence with a moderate to high potential level. The results of the mapping are divided into three conditions based on potential disasters and impacts. Based on the zoning of the potential for land subsidence,
the best pre-disaster mitigation efforts to do are choosing the type of construction according to the type of soil, conserving ground water, maintaining infiltration areas and green open spaces and regional spatial planning (RTRW). In order for this mitigation effort to run as expected, it is necessary to have good cooperation between the government, the community and related parties in order to minimize the impact that occurs as little as possible.

THE CONCEPT OF DETERMINING THE PARTICIPATION OF VILLAGE BUSINESS ENTITIES (BUMDES/BUMKEL) IN THE INTEGRATION SYSTEM OF STATE-OWNED BUSINESS ENTITIES IN MANAGING THE KAMPAR RIVER FLOW REGION

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ABSTRACT
Currently, the speed of information flow in the business world is needed, especially in data processing activities ranging from studies, surveys, planning, implementation, supervision and operations in a transparent and accurate manner. Ironically, an example of the implementation of watershed management activities can be carried out in an integrated manner from activities carried out starting at the upstream, middle and downstream if managed in the form of a business entity.

Water is a very decisive element in development in Indonesia, so that in water management, especially in watersheds, it becomes the concern of the whole community. Based on Law no. 17 of 2019 concerning Water Resources, Law no. 23 of 2014 concerning Regional Government and PP No. 54 of 2017 concerning Regional-Owned Enterprises and others, so that water regulation in the area can be carried out in accordance with the authority of the regional government to the Village/Kelurahan based on the area owned by the Village/Kelurahan for the Regency/City.
Thus, it is proposed to manage watersheds in the form of companies owned by the Central, Provincial, Regency, City and Village/Kelurahan Governments. Watershed areas according to the stipulation of the Minister of Public Works and Public Housing No. 04 of 2015 concerning River Areas in the Provinces of West Sumatra and Riau related to the Kampar Watershed in the form of BUMN that share responsibility for BUMN, Provincial BUMD, Regency/City and Village/Kelurahan, it is prepared with an Integrated System of State-Owned Enterprises in Managing the Kampar River Basin with the distribution of 30% central government, 30% province and 30% regency/municipality and 10% village/sub-district, the distribution of activities in the form of profits and losses is obtained according to the area of ownership in the Kampar watershed area which in this case gets income/loss to increase the sense of belonging, responsibility and provide local revenue/losses that own the area in the Kampar watershed.

ICDMM-329

MANAGING CONSTRUCTION PROJECT DURING THE COVID-19 PANDEMIC: A CONTRACTOR ADAPTATION

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ABSTRACT

COVID-19 has had a significant impact on the Indonesian economy, including the construction sector, which contributes significantly to the economy. The impact on the construction sector is in addition to project delays, the distribution of construction materials and materials, the reduction of labor, the reduction of working hours, and even temporarily stopping ongoing projects. This study aims to determine the adaptations made by contractors in working on
construction projects that are affected by Covid 19. The study was carried out with a case study at the Hotel Santika Premiere Padang project in February - June 2021. Of the seven indicators, only heavy equipment procurement and quality were significantly unaffected by Covid. Contractors try to adapt in project implementation for indicators of material procurement, labor, schedule, costs, and project administration.

OVERVIEW OF ROAD PERFORMANCE ON THE TSUNAMI EVACUATION ROAD DURING THE N-COVID19 PANDEMIC

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ABSTRACT
The Covid-19 pandemic has changed the world in various sectors and human activities. Limiting human activity and movement, also has an impact on transportation and traffic. This study aims to calculate the capacity and performance of roads under normal pandemic conditions before PSBB (Large-Scale Social Restrictions) in April 2020 and New Normal in July 2002, as well as predict traffic conditions if the Tsunami disaster hits the city during both periods. Tsunami Evacuation roads in Kota Padang were selected for analysis. The Indonesian Road Capacity Manual 1997 on urban roads is used as a reference for analysing road performance indicators. The results showed that; road performance during the PSBB period was better than the New Normal period. The effect of volume and side traffic disturbance factors in the New Normal period makes a significant decrease in performance. Through prediction simulations if a Tsunami occurs in the two study periods, the analysed roads can relatively serve evacuation
movements. However, the capacity needs to be increased for normal conditions.

ICDMM-349

ASSESSMENT OF TSUNAMI EVACUATION ROAD PERFORMANCE

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ABSTRACT
A series of disasters, since the 2004 Aceh Tsunami to the 2009 Padang Earthquake, have changed the paradigm of urban development in coastal areas in Indonesia. District or City Regional Regulations concerning Regional Spatial Planning finally oblige disaster mitigation by constructing evacuation roads. The attraction of the Tsunami Evacuation Road which was built with a relatively wide size in the city, makes the road a favourite route for motorists. The increased vehicular traffic also triggered the addition of the number of new commercial buildings along the road. The 1997 Indonesian Road Capacity Manual for urban roads is used as a reference in the analysis of the service performance of these road sections. The relatively rapid increase in traffic volume and side-road disturbances have resulted in a relative decline in road performance in a short period of time. The active role of the government in minimizing body side disturbances, by maximizing the implementation of traffic management and control of land use changes is an option.
ICDMM-519

DISTRIBUTED SENSOR FOR EARTHQUAKE IDENTIFICATION SYSTEM TO ACTIVATE TSUNAMI SHELTER FINDING SYSTEM

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ABSTRACT

Padang City, the capital of West Sumatera Province, is at high risk of earthquakes and tsunamis due to its location between two continental plates and the Semangko Fault. Currently, there are several shelters in Padang that serve as evacuation sites. This paper presents an earthquake detection system that uses distributed sensors to activate the shelter search system. The proposed system will activate the shelter search system when the earthquake has medium or high magnitude intensity. The earthquake identification system is achieved by calculating the Peak Ground Acceleration (PGA) value from the p-wave and s-wave using piezoelectric and accelerometer sensors. This system is a node sensor placed in different shelters which communicate using mqtt protocol. To evaluate the system we have implemented the system for earthquake detection using Raspberry Pi, piezoelectric sensor, accelerometer MPU-6050 and Xbee for data communication. The result shows that the system is able to detect the magnitude and intensity of the earthquake.

ICDMM-529

CHANGES IN LAND COVER TO REDUCE EROSION AND PEAK DISCHARGE OF SUB-WATERSHED OF DANAU LIMAU MANIS

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ABSTRACT

Land cover change is a strategic issue in the Subwatershed of Danau Limau Manis. The community was triggered by the big earthquake of September 30, 2009, so people moved to the upper watershed. The problem is the increasing number of people, the damage to the watershed ecosystem. This damage can be seen from the erosion of river water and the availability of river water during the rainy season and dry season. An appropriate solution is needed to reduce erosion by modeling land cover. This study aims to determine the value of soil erosion and peak discharge. Erosion using a rational formula using the modified universal soil loss equation model based on land units and peak discharge. The land unit is an overlay of land cover maps, slope maps, and soil maps. Land units that produce erosion and exceed the tolerance limit are carried out with a land cover change scenario using the spatial multi-criteria analysis model. Scenario determination is also based on slope maps, land cover maps, soil maps, river flow density maps, forest area maps, erosion values, and the Padang city spatial plan. The study results explain that the erosion and peak discharge resulting from the existing land cover is quite large, namely 47.89 tons/hectares/year and 152.81 m³/sec. After scenario modeling, erosion decreased by 11.91 tons/hectares/year and peak discharge 15.26 m³/sec.

ICDMM-719

DETERMINATION OF FLOOD SHELTER AND EVACUATION ROUTE IN A FLOODED AREA IN RUMBAI SUBDISTRICT, PEKANBARU

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ABSTRACT
Floods in Pekanbaru City has often hit the region along the Siak river, including the Rumbai subdistrict. Disasters such as floods have detrimental impacts on society, including a massive loss of lives. However, several strategies can minimize the impacts of flooding, including making a plan evacuation route mapping with Geographic Information Systems (GIS). This is a planning-based analysis of data using the algorithm Dijkstra for result pathways for efficient and effective evacuation. The evacuation routes involve seven simulation parameter modeling, specifically flood, length path, wide roads, road conditions, road materials, presence or absence of bridges, and the road’s direction. These parameters are processed using algorithm Dijkstra to generate the appropriate evacuation routes based on study area conditions. The analysis focuses on one evacuation route in Palas and the other six in Sri Meranti Village. The routes in Palas Village lead to the evacuation place of the Al-Jihad Mosque, while those in Sri Meranti Village heads to Al-Ikhlas Mosque, MDA Aula Rumbai, Nurul Haq Mosque, M Nurul Mosque, vacant land, and Stadium Parking Area.

ICDMM-729

COMPARATIVE ANALYSIS ON DIGITAL SURFACE MODEL OF URBAN AREA FROM SENTINEL-1 SAR INTERFEROMETRY AND AERIAL PHOTOGRAMMETRY FOR DISASTER MITIGATION PLAN

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ABSTRACT

This paper presents an effort to evaluate the generated digital elevation model (DEM) from an active sensor onboard satellite of Sentinel-1A and from aerial photos taken using an unmanned aerial vehicle (UAV). The objective is to compare the quality of generated DEM and review the processes for disaster mitigation.
and prevention plans. The radar data acquisition used in this study is pair of SLC-type radar data. The interferogram is processed from the coherence and the phase of complex data of the pair radar imageries. Meanwhile, aerial photography was taken within the smaller urban area in Padang City. The photogrammetry process to generate the DEM was conducted using the structure to motion (SfM) technique. The quality and procedures are reviewed by comparing the DEM products with other publicly available DEM data from DEMNAS, SRTM, and AW3D. This study found that generating the DEM from Sentinel-1 interferometry SAR is a challenging process. The product is unmatched and has lower quality compared to available DEM data due to several identified factors. In contrast, photogrammetry produced good quality DEM with high computational costs.

ICDMM-919

DYNAMIC TESTING OF SANDS FROM LIQUEFIED AND NON-LIQUEFIED AREAS IN PALU

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ABSTRACT

The Palu earthquakes on 28 September, 2018 have caused fatality and damaged infrastructures. This earthquake had caused a very tremendous liquefaction in several area in Palu. Related to the earthquake, the field survey had been conducted including collected sandy soil samples in Palu. The dynamic shear of laboratory test to the samples then were carried out. The results of the tests then are analyzed to have comparison between non-liquefied sand and liquefied one. Dynamic properties of the soils are in the form of shear modulus (G) and damping ratio (D). The shear modulus (G) and damping ratio (D) are the most important soil parameters in soil dynamic behavior analysis. In this this paper, the process to gain the values of those properties of sands are demonstrated. Based on the results, it was summarized that
there are differences in the those parameters that may effect to the liquefaction potential.

ICDMM-929

DESIGN OF LOCAL EARTHQUAKE DISASTER DETECTION TELEMETRY SYSTEM BASED ON WEB SERVER AND SMS GATEWAY

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ABSTRACT

Indonesia is a country that is located in the world’s tectonic plates namely Eurasian and Indo-Australian plates. Many large earthquakes are often occurred in Bengkulu with shallow depth because it is in the tectonic plate region. To anticipate the impacts of this problem, an earthquake monitoring telemetry system was created using IoT (Internet of Things) technology. The system consists of earthquake sensors and also NODEMCU which is able to connect the system to WEB. For remote areas but have the danger of earthquake uses SMS Gateway technology. The system consists of three sensors which are installed far apart using NRF Module 2401 to reach a wider area. Two sensors function as a trigger that will be combined with the main sensor as an earthquake reader, so to be able to work all sensors must be detected at the same time. NRF can function up to a distance of 140 meters but data loss occurs up to 25% and therefore the optimal of NRF is at a distance of 100 meters with an error only 5%. For SMS the module 800L SIM is used takes ± 5 seconds for the message to reach client. For network web servers, it is best to use 4G and 3G because they have better stability with a delay 1-2 seconds. The accuracy of the sensor is 13.46%.
COMPARATIVE STUDY OF SNI 1726:2012 AND SNI 1726:2019 GUIDELINES FOR RESPONSE SPECTRUM 2D METHOD (STUDY CASE: GKT II BUILDING OF BENGKALIS STATE POLYTECHNIC)

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ABSTRACT

Indonesia has a code for designing a seismic-resistant building, which has always improved year by year. Start from Peraturan Perencanaan Tahan Gempa Indonesia untuk Gedung (PPTI-UG) 1983, SNI 1726:2002, SNI 1726:2012, and the latest one SNI 1726:2019. The adoption of SNI 1726-2019 as a new standard has changed the scope of the procedure for calculating earthquakes to become wider so that it can follow the current developments. This study aims to compare the building design by using the response spectrum of SNI 1726-2012 and SNI 1726-2019 in order to determine the safety of building that still use the old rules. The building structure is modeled on a campus building with a height of 15.50 m in Bengkalis State Polytechnic, Province of Riau, namely GKT II Building. The reviewed structure behaviors are base shear and internal forces (bending moment, shear, and axial forces) on the structural elements (beams and columns). This paper also compares the design of the structural elements by using SNI 2847:2019 codes with the design of existing building before. The results prove that there is an effect of changing the design of SNI 1726-2012 to SNI 1726-2019 even though the calculation of the force in the structure of the building still uses the SNI 1726-2012, but it meets the safe limits using planning with the SNI 1726-2019.
method. Overall, the building structure can be categorized as able to withstand seismic forces based on the latest SNI 1726-2019 method.

EVALUATION OF REPRODUCTIVE HEALTH PROGRAM DURING DISASTER IN SOLOK SELATAN REGENCY, WEST SUMATERAS PROVINCE

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ABSTRACT
Disaster could effect reproductive health of maternal. The study aim to evaluate the management of reproductive health program during disaster. The study conducted a qualitative study with system approach. There were 19 informant in this study with determined by purposive sampling. Data was collected through in-depth interview, focus group discussion and document review. Data analysis used content analysis to present the result of the study. The result show that in the input component, there has been no policy, such as regional regulation for reproductive health within the disaster, human resources have double responsibility, the fund came from disaster management funds, and used an exist facilities and infrastructure only. In the process component, plan for the reproductive health programs does not exist yet, no team formation, the implementation of reproductive health services within disaster such as; data collection, assessment of needs, reproductive health care, and monitoring will be done after disaster. In the output component, the coverage of indicators for women of childbearing age has been well-served, but not for young women. Management of reproductive health programs during disasters in Solok Selatan District are not optimal in terms of inputs, process, and outputs. It is recommended to the Solok
Selatan District’s Health Office to improve the management of reproductive health programs during disasters.

THE COMPARATIVE STUDY OF ANALYZING THE T-SHAPED AND SQUARE SHAPED CONCRETE COLUMNS

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ABSTRACT
This study aims to analyze how much changes in column shape effect have on the strength of the column structure. This calculation consists of 120 samples with different concrete quality (f'c), reinforcement area and column dimensions in each sample. Column calculation analysis using Hognestad stress-strain diagram relationship and finite difference method. The result shows, the greater the reinforcement ratio, the greater the difference of Mn value and the smaller the difference of Pn value, of T shaped and square column for each.

THE CAPACITY ANALYSIS OF EFFICIENT WIDE FLANGE STEEL PROFILE AS BEAM ELEMENTS

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ABSTRACT
The aim of this study is to create graphs that can be used as a tool and will assist the structural engineers to determine the most optimum steel beam section for the given structural dimension and loadings by analyzing the cross-sectional capacity of IWF steel profile using the latest design procedures as defined in SNI 1729:2015. There are 100 IWF profile however, not all of them available in Indonesia, as the fabrication of such profile normally made by order. The type of Wide Flange profile used is the
compact web and compact flange with 8 varieties of steel grades words.

ICDMM-1329

ASSESSMENT OF BUILDING STRUCTURE BLOCK D OF RS BMC PADANG

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ABSTRACT

Padang city is the capital of West Sumatra province which is on the west side of the island of Sumatra, is earthquake prone areas, due to it is near the confluence of the Asian Euro and Indo Australia tectonic plates. In the last two decades there have been two large earthquakes in West Sumatra, on March 6, 2007 (5.8 SR) and September 30, 2009 (7.6 SR). The earthquake on September 30, 2009 has caused severe damage in several areas in West Sumatra such as Padang Pariaman Regency, Padang City, Pesisir Selatan Regency, Pariaman City, Bukittinggi City, Padangpanjang City, Agam Regency, Solok City, and West Pasaman Regency. According to Satkoral PB data, as many as 1,117 people were killed, the serious injuries reached 1,214 people, light injuries 1,688 people and the missing 1 person. A total of 135,448 homes were severely damaged, 65,380 houses were moderately damaged, and 78,604 houses were lightly damaged. The earthquake has also caused dozens of multi-story buildings in Padang City suffer damage, lightly, moderately and severely damaged and some buildings were collapsed. Block D of RS BMC is one of the buildings of RS BMC Padang, was built in early 2000. Design of the building structure of Block D of RS BMC used SNI 03-2847-1991 and SNI 03-1726-1989. Nowadays, the newest SNI is SNI 03-2847-2019 for reinforced concrete and SNI 03-1726-2019 for earthquake designs. The paper discusses the assessment of the building structure of block D of RS BMC using the new SNI 03-1726-2019 and SNI 03-2847-2019. The earthquake load used is a dynamic earthquake
load using Padang city spectrum response and structural analysis using SAP2000 v.14 software. The analysis results, obtained structural elements of columns, beams and plates are still able to resist the design loads according to the latest SNI. The inter story drift of floors, effect of P-delta, the vertical irregularities of buildings, concept of strong column weak beam and mass participation are still in accordance with the newest SNI.

ICDMM-1339

PHYSICAL CHANGES OF LOW QUALITY OF CLAY BRICKS DUE TO SANDY-SOIL MIXTURE UNDER COMBUSTION PERFORMANCE

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ABSTRACT
This research studies the physical properties of bricks mixed with sandy soil in a home industry located in the Gunung Sarik area of Padang City. Here the mixing is carried out approximate and without measure so that the bricks are of low quality. The research used 5 x 5 x 5 cm and 180 cubes of bricks to see the physical changes. The ratio of mixed materials between sandy soil and clay are 0.11, 0.25, 0.43, 0.67, 1.0, and 1.50. The procedure for making bricks is the same as a factory without changing the factory method. The process of burning bricks for three days and two nights using wood. From the test results, the density of the bricks did not change significantly between direct and indirect fire exposure but decreased in proportion to the addition of sandy soil. The addition of sandy soil will reduce the percentage of damage and physical changes. The good sandy soil mix ratio is 0.43-0.6.
ICDMM-1359

GEOMAGNETIC ANOMALY ASSOCIATED WITH FUKUSHIMA EARTHQUAKE ON FEBRUARY 11TH 2021

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ABSTRACT
In this study, we performed research on electromagnetic anomalies related to earthquake as early signs (precursors) of earthquake that occurred in Fukushima, Japan on February 11th 2021. The research focused on utilization of geomagnetic field data which were derived from Kakioka (KAK), Kanoya (KNY) and Memambetsu (MMB) observatory particularly in the ultra-low frequency (ULF) to detect earthquake precursor. The method of electromagnetic data processing was conducted by applying polarization ratio. In addition, we improved the methodology by splitting the ULF data (which was range from 0.01-0.06 Hz) into 6 center frequency and pick up the highest value from each central frequency to get the polarization ratio. The anomaly of magnetic polarization was identified 15-45 days before the main shock in all range frequency. Furthermore, the highest magnitude was obtained from 0.01 Hz that can be identified as earthquake precursors in Fukushima Japan.

ICDMM-1419

SEISMIC ASSESSMENT TOWARD MULTI-STORY BUILDING OF STEEL SPECIAL MOMENT FRAME BY CONSIDERING THE SETBACK IRREGULARITIES

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Setback irregularities are considered where discontinuity between adjacent stories is excessive. This irregularity caused probability of high damage at structures subjected to strong earthquake motion. For this purpose, this study was conducted by modelling the steel special moment frame (SMF) structures using finite element calculation program with nonlinear static analysis comparing to Padang city's response spectrum. The buildings were also modelled with two types of setback; single and multiple setbacks. The results of this paper are discussed including the explanation of many parameters that relate to seismic behaviours and performance of steel special moment frame (SMF). Due to the setback irregularities, both single and multiple setbacks, the seismic performance is getting poorer when the percentage of setback is also larger than 150%. Moreover, the distribution of plastic hinge between beams and columns is not equally distributed along the stories and tend to having stress concentration where the discontinuity between adjacent stories is applied. The seismic responses are also discussed in terms of inter-story drift, story stiffness, base shear, and demand capacity. Referred to Indonesian Seismic Provision, SNI 1726:2019, it is found that single setback building has more adequate than multiple setbacks in terms of seismic responses. Then, the seismic assessments between these setbacks are explained to address the recommendations about future prevention toward damages and failures in steel buildings.

THE FRAMING OF DECISION MAKING SUPPORT SYSTEMS ON INCREASING COMMUNITY RESILIENCE IN DISASTER RISK REDUCTION EFFORTS: A CONCEPTUAL APPROACH

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ICDMM-1519

IMPLEMENTATION OF EARTHQUAKE MITIGATION AT THE ENGINEERING FACULTY, UNIVERSITY OF MATARAM

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ABSTRACT

This research begins by comprehensively exploring previous research related to community resilience and what steps are used to increase community resilience in reducing disaster risk. Conceptually, it is known that the fatigue model accumulated by the time system, infrastructure system, governance system, regulatory system, and hazard system for disaster risk reduction is often associated with weakening community resilience. It is often associated with catastrophic events, which are sometimes predictable and unpredictable. In manual decision-making, people are aware of the inconsistency of subjective decisions. A decision support system hypothesizes that it will take less time to explore data to make faster and more informed decisions. As a result of this concept, it is possible to reduce the number of wrong choices when dealing with disaster risk reduction issues. In terms of disaster risk reduction, the power of decision support systems is discussed in this paper to find a framework for its effectiveness as relative decision making will differ on different dimensions of Resilience.

ICDMM 2021 | 140
After the 2018 Lombok earthquakes, buildings within the Engineering Faculty of University of Mataram (FT Unram), were severely damaged and there has been no comprehensive treatments. Facilities to support earthquake mitigation, such as signs for evacuation routes and gathering (temporary evacuation) points, are still minimal, and even if they are available, many of them are not designed and placed properly. Some parts of the buildings have partially renovated, meanwhile there are new buildings constructions that have not been studied related to disaster mitigation. Anticipating re-occurrence of big earthquakes in Lombok, it is very necessary to carry out activities for implementing earthquake mitigation at FT Unram. The activities are divided into three stages, namely first: conducting a direct reviews for inventory and documentations of all vulnerable points, followed by making of maps/building plans and related infographics; second: determining the proper locations of assembly (temporary evacuation) points, creating labels and signs for evacuation routes and assembly points, and making tutorial videos on safety instructions; third: socialization to the policy makers (Faculties and Department’s officials), and outreach to the academic communities. The expected output of these activities is increasing of understanding and skills of the academic community in conducting disaster mitigation at their own workplaces and application of technology as well as recommendations for disaster risk reduction policies at the faculty and university level.

IMPLEMENTATION OF NON-LINEAR CONTROLLER ON PHOTOVOLTAIC MAXIMUM POWER POINT TRACKER FOR ENERGY STORAGE EQUIPMENT CHARGER

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ABSTRACT
Portable energy storage system is an infrastructure for providing electrical energy needed to support the recovery process after a natural disaster. This system is a battery arrangement that can be recharged using locally available primary energy sources such as photovoltaic. The main problem in using photovoltaic as power source for this equipment is to increase the efficiency of power extraction (energy harvesting) during recharging process. Traditionally, to obtain maximum extraction conditions, conventional linear maximum power point tracker (MPPT) mechanisms such as PID-based MPPT and the like are used. However, if the PV and the storage system works at various locations with environmental condition behave unusually, the conventional MPPT cannot work accurately and optimally. In this paper, the Fuzzy method for constructing a nonlinear controller-based MPPT was studied. The step size of the tracking process in the conventional MPPT P&O method is modified by involving the fuzzy algorithm. This algorithm then is applied to a DC-DC converter to test the performance criteria such as the response and efficiency of the resulting power extraction. The testing and computer simulations show that the conventional MPPT mechanism can provide prospective results through modification and application of a non-linear controller.

ICDMM-1559

VARIATIONS IN THE PLACEMENT OF GABIONS IN DOWNSTREAM OF THE WEIR’S POND AGAINST BASE SCOURING PATTERN

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ABSTRACT
The use of river water for irrigation purposes is often built weirs to raise the water level of the river. The existence of a weir is often disturbed by the occurrence of scouring, which results in an
insecure weir position. This study aims to determine the location of the most dominant scour downstream of the stilling pond which is installed with gabions as basic safety, so that the amount of scour that occurs both in length and width in variations in flow discharge can be known. with dimensions of 7.5 m x 0.55 m x 0.5 m, using an Ogee type weir and a USBR Type III stilling pool. Gabions have dimensions of 0.55 m x 0.18 m x 0.09 m with variations in gravel diameter of D1 0.035 m, D2 0.0175 m and D3 0.00875 m. The test uses 4 variations of discharge, namely Q1 0.0019 m³/sec, Q2 0.0036 m³/sec, Q3 0.0047 m³/sec and Q4. 0.0065 m³/s. The results of the analysis show that in conditions without gabions, scour is prone to occur downstream of the stilling pond in the middle to the right side of the channel, with a scour length of 0.075m – 0.45m and a scour depth of 2mm – 23mm. For conditions with gabions, the scour length of 0.15m – 0.275m and a scour depth of 1.6mm - 25.7mm with the scouring occurring more evenly to the left and right of the channel.
river channel is becoming increasingly difficult to control. This paper proposed an idea to identify river conditions based on suspended sediment transporting capacity. A resulting map contains information on the rate of suspended sediment transport in the form of a suspended sediment-flow discharge rating curve which is designed as a sediment conservation health indicators of the watershed. The map allows the authority to identify and determine the condition of each river order since the nearby tributaries are most likely to have their own pattern of sediment transport rate. This early discovery of the problem can facilitate the drafting and implementation of the right policy in watershed management which lead to a preventive and better preparedness in disaster mitigation.

ICDMM-1579

STATE OF THE ART OF SEISMIC RISK AND LOSS ASSESSMENT IN STRUCTURES

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ABSTRACT

Earthquakes are known as one of the disasters that have fatal consequences for human safety. However, it is certain that the earthquake itself is not the main cause of the losses suffered by humans, both material and soul. The most decisive thing in human safety is infrastructure such as buildings, bridges, houses, and others. Therefore, an in-depth analysis of the risk factors that will be experienced by the infrastructure in the event of a natural disaster is needed. In Southeast Asia region, there is variable seismic hazard, ranging from high seismic hazard allied with the underneath of the Indonesian and Philippine archipelagos to moderate and low seismic tremors associated with a large stable region on the Sunda Shelf. This paper describes the history of seismic risk and loss assessment of infrastructures. Method used is by doing literature reviews of most recent research relating to
seismic risk and assessment around the world. More than fifty research results are deeply studied and discussed in order to get a deep knowledge about seismic risk and also the assessment of loss due to seismic disaster.

THE GOVERNMENT REGULATIONS ON COVID-19 PANDEMICS IN INDONESIA: IMPLEMENTATION AND CHALLENGES

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ABSTRACT

Covid-19 started in China and then spread to other countries. The government officially announced the first case of Covid-19 on March 2, 2020. Previously, on February 4, the Ministry of Health issued a Decree of the Minister of Health number HK.01.07 of 2020 regarding "Determination of Novel Coronavirus Infection (2019-Ncov Infection) as a Disease That Can Cause Outbreaks And Efforts to Overcome it". WHO then declared Covid-19 as a pandemic on March 11, 2021. After that, the central government issued various regulations related to the handling of Covid-19. This paper aims to study the regulations issued by the Indonesian government regarding the handling of COVID-19. The research method uses a content analysis method using nVivo software. The study results show that the regulations are quantified, consisting of 30% related to social, 10% related to the budget, 25% related to health, 20% related to Covid-19 handling organizations, and 15% related to economic recovery. This paper also presents the challenges related to the implementation of these regulations.
DISASTER MITIGATION LOCAL WISDOM IN THE TRADITION OF THE MINANGKABAU COMMUNITY

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ABSTRACT
This study is about Minangkabau local wisdom in disaster mitigation. Minangkabau is an ethnic and cultural group that is still alive and developing today. This ethnic group is centered in West Sumatra in the highlands of Bukit Barisan which stretches along the island of Sumatra and develops through migrating to various regions in the world. This ethnicity is the oldest tribe on earth which is characterized by the use of the hereditary system according to the maternal or matrilineal line. His leadership made the Minangkabau ethnic have various kinds of local wisdom, especially those directly related to disaster mitigation. The Minangkabau cultural center is located in an area that has a high intensity of natural disasters in accordance with its natural topography. In responding to their natural environment, the Minangkabau community has local wisdom in the form of a superstructure that regulates infrastructure and social structure in disaster mitigation. This local wisdom is found in various literacy and traditions of the Minangkabau community. This qualitative discussion uses the perspective of cultural materialism theory. It was found that the local wisdom of disaster mitigation includes human norms and attitudes towards nature; norms before a disaster occurs; and post-disaster policies. To anticipate disasters, there are rules regarding the processing and utilization of nature, such as the use of land, hills, deserts, and swamps. In the event of a disaster there are rules such as building rangkiang and filling it with food reserves, doing the ijok tradition, and batangeh.
ANALYSIS OF EXTERIOR REINFORCED CONCRETE BEAM

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ABSTRACT

Many failures of building structures occur in the beam-column connection area caused by the loading of earthquake forces that occur cyclically (back and forth). Reinforcement is needed to overcome the failure in the beam connection. Reinforcement of beam-column joints has been carried out by various methods, such as the connection enlargement/jacketing method, the use of FRP (Fiber Reinforced Polymer) or GFRP (Glass Fiber Reinforced Polymer), and using steel profile stiffeners. These methods require a fairly expensive cost and complexity in the process. Therefore, this research was conducted to obtain a method of strengthening that is more efficient and easy to do. In this study, a numerical model for the connection of reinforced concrete column beams without reinforcement and column beam connections that was given reinforcement in the form of L steel plates was made. The application of the finite element model for L steel plate reinforcement on reinforced concrete column beam connections was analyzed with the help of ATENA software. From the results of the study, it was found that the installation of L steel plate on the exterior reinforced concrete column beam joint was quite efficient in increasing the strengthening of the column beam connection.

STABILITY ANALYSIS OF CONCRETE BLOCK RETAINING WALL BASED ON A SCALDED LABORATORY TEST MODEL

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ABSTRACT
In this paper, the results of the Concrete block retaining wall model tests are presented. The retaining wall models are made of concrete mortar with backfill sandy soil. The wall models, Concrete block retaining wall and the sandy soil are arranged in a glass test box. Incremental distributed load on the surface of the embankment is then applied. During the tests, the applied load and the movement of the sand soil particle behind the walls are recorded. Based on the test results, the pattern of failure soil behind the Concrete block retaining wall is plotted, and a mathematical formulation of the failure pattern is formulated. The formula obtained is in the form of a polynomial function equation. The Concrete block retaining wall model which a face-off wall in contact with backfill is vertical produces a failure area that is larger than the area of the failure using the Rankine theory. Furthermore, the center point and area of the failure are obtained from the equation of the function. The stability of the Concrete block retaining wall is analyzed based on the failure pattern. The results of this study are very useful for analyzing the stability of non-reinforced segmental/block walls in practical.
ABSTRACT

During the adaptation period to new habits, every hospital needs to make some changes to prevent the transmission of Covid infections in hospitals. The Ministry of Health has issued a technical guide that should be a guide for every hospital. The Army Hospital in Padang City has a different communication flow and chain of command from hospitals owned by health institutions. This study aims to analyze efforts to optimize services for COVID-19 patients during the adaptation period for new habits. The research design is qualitative. The study was conducted in October-December 2020. The unit of analysis is the Covid and non-covid emergency department services. Data were collected by interview, observation and document review. The results of the study found that emergency room services were not in accordance with the technical guidelines for hospital services during the adaptation period for new habits. Some of the causes seen in terms of input are service personnel, rooms and equipment, funding and patient behavior as well as from the screening process. Steps that can be taken to optimize services are to create a service flow, install zone barriers, move screening rooms and improve patient education and carry out periodic monitoring and evaluation.

ICDM-5139

FLEXURAL CAPACITY OF RC BEAMS STRENGTHENED WITH NEAR SURFACE MOUNTED STEEL BARS

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ABSTRACT

An experimental study of the flexural capacity of reinforced concrete beams strengthened with Near Surface Mounted (NSM) steel bars is presented. The test was carried out on nine concrete beams. All tested beams were subjected to two-point monotonic loads. The amount of longitudinal reinforcement (1%, 1.4%, and
2.4%) and NSM bars (1D16 and 2D16) were used as test variables. It was found from test result that NSM steel bars increase the flexural capacity of reinforced concrete beams significantly. However, in the all case of reinforcement ratios the beams failed in brittle mode as indicated by a sudden drop beams capacity. Analytical study was also conducted to obtain the flexural response of the specimens through all ranges of elastic and post-peak load. Analytical prediction compares well with the test result.

ICDMM-5149

SEISMIC PERFORMANCE OF REINFORCED CONCRETE STRUCTURE UNDER HIGH INTENSITY EARTHQUAKE LOAD WITH PERFORMANCE BASED PLASTIC DESIGN (PBPD) METHOD

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ABSTRACT

Indonesia is currently using the guidelines of SNI 1726:2019 regarding procedures for planning earthquake resistance for building and non-building structures which is a replacement regulation for SNI 1726:2012. In addition, researchers Liao & Goel (2010) have also developed the Performance Based Plastic Design (PBPD) method which is used for steel structures, but now it can also be used for reinforced concrete structures. In this study, a study was conducted on a 10-story reinforced concrete structure that was given an earthquake load in the form of lateral forces based on SNI 1726:2019 and the Performance Based Plastic Design (PBPD) method. After that, a pushover analysis was carried out where the structure was really pushed (push) to obtain lateral load resistance followed by yielding gradually until plastic deformation occurred to collapse. From the pushover analysis, the ductility value for SNI 1726:2019 is less than analytical using the Performance Based Plastic Design (PBPD) method. The structural performance level for SNI 1726:2019 is included in the damage
control level and for the Performance Based Plastic Design (PBPD) method, it is included in the life safety level.

ICDMM-5159

ANALYSIS THE EFFECT OF VARIOUS SUPPORT DISTANCE TO THE BOND-STRENGTH OF PLAIN ANCHOR BOLT IN CONCRETE

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ABSTRACT

The structural components of reinforced concrete that withstand the tensile stress, there will be bonding stress affected by the friction between the reinforcing bar and the concrete. Anchoring depth, reinforcement diameter, and concrete quality are commonly assumed can influence the value of bond-strength, besides the support distance of reinforcement may be one of the influencing factors as well. The samples in this study were cylindrical specimen 15 x 30 cm for compression strength test, cylindrical specimen 20 x 30 cm for the bond-strength test, and double-L size 30 x 20 x 7.5 cm for the concrete shear test. Variables in this study include variations in the support distance represented by variations in the diameter of the supporting plate hole, namely 10 mm, 35 mm, 60 mm, 85 mm, and 110 mm. Plain reinforcement with a diameter of 10 mm was anchored in the center of the concrete cylinder with a depth of 150 mm on normal concrete. The experimental results obtained the concrete compression strength of 26.49 MPa and shear strength of 10.86 MPa. The bond-strength test with various diameters of the supporting plate hole showed that the hole diameter of 10 mm to 60 mm had a stable increase in bond-strength and a significant decrease when a larger hole diameter was used.
STRATEGIES FOR STRENGTHENING ECONOMY OF SMALLHOLDER FARMER HOUSEHOLDS AFTER THE 2018 EARTHQUAKES THROUGH DEVELOPING AGRIBUSINESS OF VEGETABLE AND SEASONAL FRUITS IN UPLAND OF NORTH LOMBOK WEST NUSA TENGGARA

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ABSTRACT

This research brings to reality restoration of smallholder households economy through developing agribusiness of high economic value of upland horticulture commodities. The general objective of the research is to analyse the acceleration of economic recovery of smallholder farmer households after the 2018 earthquake through empowering farmer groups of dry land horticulture agribusiness based. The specific objective is to determining and analysing the effect of the synergy among Higher Education Institution, Local Government, Agricultural Extension officer and private enterprise with the mission of Better Farming, Better Business and Better Living. It was the longitudinal action research by implementing Participatory Action Research with society participatory approach. The first stage of sequential on the farmer's land was Focused Group Discussion to socialize the program. It was followed by pioneering work of partnership with actors of tourism business as being output market of vegetables and fruits that farmers grown. The data was not only recoded from farmers target groups, but it was also gathered from 60 smallholder farmers surveys in three villages nearby the pilot project village. The cross classification between food expenditure and sufficiency of energy consumption was used to measure the degree of food security of household. Meanwhile, the regression analysis of Multinomial Logistic was used to analyse the factors affecting food security degree of households. It is concluded that developing agribusiness of upland horticulture has high potential
for reinforcement of economic recovery of smallholder farmer's household after the 2018 earthquakes and pandemic COVID-19. Implementing Tripartite approach for developing agribusiness of dryland horticulture base has a positive impact for strengthening and economic recovery of smallholders farmers households. They were in enough food category that depicted by 85.50% of energy consumption degree. Food security based on distribution of household food need was in the category of low expenditure of food (less than 60%). Food security of household based on cross combination between the degree of energy consumption and the proportion of food expenditure were 61% of them were resistance to food security, 30.85% of household were vulnerable of food security, and 6.20% of households were troubled of food security and 61.25% of them were lack of food. The dryland household farmers have high intrinsic motivation for growing crop of horticulture. It is indicated that they realize that North Lombok region is a tourism destination that needs to be supported by supplying high economic value, quality insurance and friendly environment of vegetables and fruits. Therefore, the tripartite approach should be expanded and completed by involving local business actor for output marking.

ICDMM-2089

MOTORISTS MOVEMENT BEHAVIOUR ANALYSIS WHEN CROSSING AN UNSIGNALISED INTERSECTION BASED ON IMAGE CAPTURED BY A DRONE

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ABSTRACT

This paper presents an observation of the movement of motorists from a minor road crossing a major road at an unsignalised
intersection. The objectives of the study are to estimate the gap and lag of motorcyclist when crossing the intersection, observing forced gap and predict the effect of traffic volume on the variation of the gap and lag. The case study was located at Intersection between Ahmad Yani Road as major road and Bandar Purus Road as the minor road in Padang, Indonesia. A drone was used and placed vertically above the centre of the intersection to record the movement. The study found that at off-peak, the average lag is 2.4 second and average gap is 4.3 seconds and at the peak hour, are 2.0 second and 3.1 seconds respectively. At peak hour, more than 80% of motorcyclist are committed to the force gap/lag.

ANALYSIS OF LANDSLIDE POTENTIAL DUE TO CHANGES OF LAND USE/ LAND-COVER AT THE KURANJI WATERSHED, PADANG USING NORMALIZED DIFFERENCE BUILT-UP INDEX (NDBI)

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ABSTRACT
West Sumatra is one of the provinces that are prone to natural disasters, one of which is landslides. Landslides can be caused by natural and human factors. Land-use change is one of the causes of landslides. The earthquake and tsunami predictions in the city of Padang have caused very rapid land-use changes, especially in the Kuranji watershed, where people tend to seek locations that are safe from tsunamis and liquefaction. Changes in environmental characteristics such as slope geometry conditions, vegetation density, and changes in land-use will affect runoff coefficient and rainwater filtration, triggering a potential for landslides. Besides natural factors such as geological conditions, soil type, rainfall, seismicity, and others greatly affect the potential for landslides. This study aims to analyze the potential for
Landslides due to changes in land use in the Kuranji Watershed. Remote sensing is one of the most effective ways to determine changes in land-use over a certain period. The identification of land-use change is carried out using a remote sensing approach, namely the Normalized Difference Built-Up Index (NDBI). Based on land-use/land-cover, the relationship between the runoff coefficient and potential landslides that occurred during the 2007 to 2019 period was sought. The results showed that there had been an increase in the built-up area in the Kuranji watershed from 1602.212 ha (2007) to 2897.513 ha (2019). While the vegetation area has decreased. An increase in the runoff coefficient of 3.9% from 2007 to 2019. The value is still safe because of an increase in the average per year of 0.325%. Changes in runoff coefficient values in the Batang Kuranji watershed are influenced by changes in land-use in the Kuranji watershed. From the results of this study, thematic geospatial information will be obtained in the form of the relationship between changes in land-use and the potential for landslides that occurred in the Kuranji watershed during the period 2007 to 2019.

Identification of the Causes of Cost Overrun in Construction Projects Affected by the COVID19 Pandemic

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ABSTRACT

Covid19 pandemic has caused many problems to human activities, including construction. The purpose of this study is to identify the causes of cost overruns construction that occurred due to the COVID-19 pandemic on contractors who working on the construction project of Hotel Santika Premiere Padang. The data sources in this study are primary data in research, obtained by conducting interviews and observing the construction site. This
research is a qualitative method, that is, the type of method research that can explain something based on the data and numbers used for research. In addition, the method of the research is also literature study which means that data collection was carried out by search for data and information through available documents, both written documents such as photos and pictures, as well as electronic documents that can support in the process of research. The data included by the researcher is data on changes in costs that occur during pandemic namely, material, manpower, equipment, OHS, and overhead which make construction cost overruns on project construction of the Santika Premiere Padang Hotel due to the COVID-19 pandemic.

ICDMM-5189

COMPARING THE EVACUATION SPEED THROUGH A RAMP AND A STAIR IN A TSUNAMI EVACUATION DRILL IN PADANG.

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ABSTRACT

In vertical evacuation, there are two type of route could be chosen namely a ramp and a stair. A ramp is usually used to help defable person with wellchair to rich the top of a shelter and a stair is used for normal persons. However, in an evacuation the speed is very important. Therefore, a comparison between the use of stair and ramp in terms of evacuation speed to reach the top should be evaluated. This paper presents an evaluation of the evacuation speed using stair and ramp by normal persons. The study found that evacuate using stair is slightly faster than using a ramp.
A JURIDICAL REVIEW OF DISASTER MANAGEMENT POLICY IN ASEAN AND THE CORRELATION WITH THE DOMESTIC MANAGEMENT SYSTEM OF DISASTER IN INDONESIA

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ABSTRACT
The territory of Indonesia had any potential geography, geology, hydrology, and demographic for disaster, whether it was caused by natural factors, engineering or human error resulting in fatalities, environmental breakdown, loss of property, and psychological effect to obstruct the national development in particular situation. For these reasons, the national government issued an Act No. 24 of 2007 on Disaster Management as it has become the base of law and reference to the management of domestic disaster in Indonesia. The policy of this management system based on implementation of activity immediately in the situation to manage the arising worst impact of disaster involving rescue and evacuation of victims, properties, compliance of demand, shelter, refugees handling, rescue, and facilities-infrastructure restoration. Moreover, the Act regulating on disaster mitigation-based layout system setting in attempt to improve of safety and living comfort. Especially in regional scope of ASEAN, it also put an interest to the management of disaster as the territory is the most potential for disaster in the world. The established regulation for disaster management is ASEAN Agreement on Disaster Management and Emergency Response (AADMER) that establishes An ASEAN Coordinating Centre for Humanitarian Assistance on Disaster Management (AHA Centre). It is facilitating cooperation and coordination of disaster management in ASEAN.
ANALYSIS OF THE WIND POWER POTENTIAL AS ELECTRICITY POWER USED IN SAFETY SIGN LIGHTS ON LIMESTONE MINING HAULING ROADS
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ABSTRACT
Work accident can occur anytime and anywhere if they take unsafe actions and in unsafe conditions. Mining areas located in the hills have unsafe conditions for operating heavy equipment, such as steep terrain conditions, slippery roads and foggy weather and lack of lighting. Installation of lights as signs is the right step in reducing work accidents at night, foggy and rainy weather. Measurement of wind data and calculation of wind potential statistically using the Weibull distribution. The values of c and k are 1.54 and 3.7, respectively, with an average speed of 1.39 m/s with a wind power density of 1.99 w/m2. because it is in the hills and not far from the beach, this quarry almost always gets wind gusts both day and night, so it has the potential to take advantage of wind energy in small and medium power.

EMPOWERING COMMUNITY THROUGH CREATIVE ECONOMY AS A DISASTER RISK REDUCTION STRATEGY IN INDONESIA
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ABSTRACT

Indonesia as the largest archipelagic country in the world, has the potential for a creative economy in terms of unique resources, language and culture. In the 21st century, the world is faced with the global COVID-19 pandemic, a disaster that has had wide-ranging health, social, food and economic negative impacts throughout the world and also in Indonesia due to the cessation of the mobility of most people and economic engines. The creative industry is proven to be one of the pillars of disaster risk reduction recovering the social and economic impact of COVID-19 in the community by empowering the community based on innovation and creativity. The method used is an ethnographic approach starting from the collection of literature sources and supported by field data. The results show that the concept of the creative economy is creative ideas developed by humans supported by the use of technology so as to produce innovative products and cultures, have regional imagery but are globally competitive and can ultimately provide value to the national economy. Intellectual actors are not only academics but also include industry players, pioneers, figures in the arts, culture and sciences who have a role in providing creative ideas, innovations in the creative industry. Creative industry enabling community to create products by utilizing the rich variety of bamboo forest resources in the Papring neighborhood, Kalipuro Village, Banyuwangi. The products produced are a means of reducing the use of plastic waste and are environmentally friendly, increasing the income of local communities and MSMEs and forming a sustainable creative economic ecosystem.
ANALYSIS OF THE READINESS OF THE ROPANASURI SPECIAL SURGERY HOSPITAL IN FACING COVID-19

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ABSTRACT
The World Health Organization officially declared the Covid-19 virus as a pandemic on March 9, 2020. The Covid-19 pandemic greatly affected health facilities, especially hospitals, the emergence of various complex problems. The purpose of writing this article is to identify the conditions and readiness of the Ropanasuri Special Surgery Hospital in the face of the Covid-19 pandemic. The research method and design are descriptive qualitative, supported by literature studies. The output of this article is expected to be input for strengthening emergency prevention and response strategies, building strong governance, and increasing community participation in preparedness and early response to pandemics in the future.

THE ANALYSIS OF URBAN FLOOD USING SYNTHETIC UNIT HYDROGRAPH (SUH) AND ITS MITIGATION ALONG WAY HALIM RIVER (CASE STUDY ON SEROJA STREET, TANJUNG SENANG DISTRICT)

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ABSTRACT

In urban area, flooding becomes the most common disaster that has not been resolved until today. Utilization river border area into housing and lack of absorption area becomes the trigger factor of urban flooding, as what is happened around Way Halim river on Seroja street. In this area, floods often happen during rainy season, with latest events recorded on January 21st 2021. The analysis of flood intensity and discharge can be a parameter for decision making of flood mitigation. This study aims to analyze the flood discharge by comparing the results of the three analysis of Synthetic Unit Hydrograph (SUH) methods, and looking for suitable mitigation based on the discharge and rain intensity. The results showed that Gamma I SUH had the highest peak flood discharge, equal to 0.3425 m3/s, while the Snyder SUH and Nakayasu SUH gave the peak flood discharge results equal to 0.2340 m3/s and 0.3579 m3/s. Then based on the results of the investigation of land suitability and analysis of rainfall intensity and flood discharge, Urban flood mitigation that can be done is by making biopore infiltration holes as a means for storing water and reducing the risk of flooding in the area.

FINITE ELEMENT MODELING OF PULL-OUT TEST OF DEFORMED STEEL REBAR EMBEDDED IN WELL-CONFINED CONCRETE UNDER MONOTONIC LOADING

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ABSTRACT
Finite element study carried out using LS DYNA and aimed to simulate the monotonic pull-out test of deformed steel rebar embedded in concrete is presented in this paper. Two models of interface between deformed steel rebar and well confined concrete, i.e. perfect bond model and bond-slip model are observed and compared. Bond stress-slip response and rebar stress-slip response obtained numerically are validated with experimental data available (Xu et al., 2017) and empirical equations proposed by Murcia-Delso and Shing (2014). The full bond model overestimates the response, providing higher rebar stress. In the bond-slip model, good agreement is observed between numerical and experimental bond stress and rebar stress–slip responses. However, empirical equation of bond-slip proposed by Murcia-Delso and Shing (2014) is found to overestimate the bond stress.

ICDMM- 1719

ANALYSES OF FLOOD DISCHARGES IN CIMADUR RIVER BASIN, BANTEN PROVINCE

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ABSTRACT

Cimadur River basin is the most important catchment area in Lebak District, Banten Province. Since the past few years, the catchment has experienced the floods during the raining season. The big issue of flooding has been recorded recently on December 2019 which have caused damage and negative impacts to the local people and surrounding community. This study aims to analyze the floods discharges in the catchment area of Cimadur River. The discharges are calculated for 5, 10, 25 and 50 years return period based on the daily rainfall data from year 2011 to 2020. In this study, the hydrological analyses are carried out using Thyssen method; by determining the best flood distribution models among Log Pearson Type III, Log Normal and Gumbel Type 1; and rational
method. The rainfall distribution analyses showed that the Log Pearson Type III provided the best fit. Based on the flood discharges analyses, the results showed that the flood discharges for 5, 10, 25 and 50 years return period in the Cimadur River basin are 101, 6 m³/s, 127,2 m³/s, 165,7 m³/s and 199,45 m³/s, respectively.

ICDMM-1819

DISASTERS AND ACCIDENTS RESULTING USE OF 3D COORDINATION TECHNOLOGY IN CIVIL ENGINEERING INDUSTRY

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ABSTRACT

As a result of the amazing progress in the engineering industries, it is necessary to achieve cooperation between the engineering disciplines in providing a suitable environment for the development of civil industries. Mechanical engineers designed and implemented 3D coordinate machines (winches) to speed up the production of civil industries, especially tall structures such as buildings and bridges. Civil engineering works such as buildings, infrastructure, and bridges are central to the development of human civilization. However, it is also a source for some types of accidents and disasters, which will be referred to in this paper as civil engineering disasters. This paper discusses the concept of civil engineering disasters, their types and characteristics, especially those that talk about the use of high-coordinate 3D techniques and ways to
mitigate them. These accidents in practice occur due to defects in dynamic equilibrium during the operation of equipment used in civil engineering, which are usually due to incorrect selection or behavior on the construction site, installation, maintenance, operation and ambient conditions. Civil engineering disasters occur frequently and globally because they are closely related to human behavior and performance. This paper confirms that the situation can be managed with an accurate system to mitigate such disasters mainly by taking some appropriate administrative and engineering proposals related to a scientific method to meet these challenges.

ICDMM-1829
LIQUEFACTION POTENTIAL OF UBH AREA BASED ON GRAIN SIZE AND RELATIVE DENSITY

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ABSTRACT
Soil liquefaction phenomena have occurred during earthquakes in sandy soils under saturated conditions. In addition to saturated conditions, sandy soils with certain physical properties have the potential to liquefy. The physical properties of sandy soils that have an effect on the liquefaction potential include grain size and relative density. In this paper, the results of the investigation of the physical properties of the soil in relation to the liquefaction potential are presented. This study was conducted in an area named UBH in the city of Padang. The depth of the groundwater table at the area is near to the ground surface. Soil samples were taken at the depth of the groundwater table. Furthermore, laboratory analysis was carried out to obtain the parameters of relative density, Dr and grain gradation. From the grain gradation, the average grain size value, D50, then can be obtained. These two soil parameters are then plotted on the advanced developed liquefaction limit curve to gain the soil liquefaction potential.
Based on the results of this study, it is known that some sites have the potential to be liquefied in case of earthquakes with a certain strength, while there are some sites have no liquefaction potential.

ICDMM-1839

SPATIAL ASSESSMENT AND HEALTH IMPACT OF ATMOSPHERIC POLLUTION IN MAKASSAR, INDONESIA

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ABSTRACT

There has been little discussion to date on air pollution and its potential relationship with health in Makassar, Indonesia. This study aims to create a starting point for this discussion by investigating existing data points and potential correlation between ambient air pollution and health in Makassar, Indonesia. Six months of air quality data (July-December, 2018) on CO, SO2, NO2, O3, PM10 and PM2.5 were provided by the city, and were analyzed alongside tuberculosis and pneumonia data provided by hospital and community health centers in Makassar. Data were analyzed using principal component analysis, dendrogram and some GIS mapping. Quantitative data from USAID-funded Building Health Cities project were also used to help explain some of the quantitative findings. Results show that principal component analysis (PCA) gave three statistics factors having eigenvalues

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exceeding one, which account for 83% of the total variance in the dataset. The three factors accounted for a strong impact by CO, O3, SO2, PM10 and PM2.5 attributed to the incomplete combustion of fuel from automobiles, bush burning and industrial emission. Air pollution related illness such as tuberculosis and pneumonia are found to prevail in the area. Real time air quality monitoring is required to benchmark the health impact of extreme conditions. This study also encourages urgent intervention by decision makers to tackle the level of tuberculosis and pneumonia occurrence that may be favoured by the poor air quality in Makassar.

IMPLEMENTATION OF PUBLIC WORKS AND HOUSING MINISTER INSTRUCTION NO. 02/IN/M/2020 IN SMALL SCALE IRRIGATION PROJECTS DURING COVID 19 PANDEMIC IN PADANG AND PADANG PARIAMAN DISTRICTS

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ABSTRACT
Since the discovery of coronavirus disease 19 (Covid-19) and its spreading, development, and economic growth were hampered. The acceleration of infrastructure development plays a major role in revitalizing the economy. Especially in Irrigation Projects, Government implement PKT (Cash for work) Program. This program empowering the community in one way to recovery community income due to the covid pandemic 19. Government combined this program with P3-TGAI Program (the Acceleration for Irrigation Water Usability Improvement). Programs involved many people in the projects. Efforts are needed to prevent the spread and reduce the impact in the implementation of construction services. The Ministry of Public Works and Housing (PW-H) issued ministerial instruction number 2 of 2020 regarding the protocol to prevent the spread of Covid-19. This article
presents the implementation of this ministerial instruction in the small scale irrigation projects. This research uses a literature review method to describe whether the instruction were well implemented in the Projects. The results of the study were that, although the covid 19 protocol was not fully implemented.

ICDMM-1939

THE EARTHQUAKE OF 1926 IN PADANG PANJANG WEST SUMATRA

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ABSTRACT
This study explores contemporary narratives in local newspapers at that time both written in Indonesian and Dutch on the devastation caused by the 1926 earthquake in Padang Panjang, West Sumatra. It becomes important amidst the difficulty of finding historical statistical data on disaster studies discussing the chaotic situation caused by natural disasters in the past. Historical methodologies and methods functioned to combine fragments of information written in these contemporary newspapers, especially those discussing how the Dutch Colonial government handled the situation in society and what policies were made following this natural disaster. This study further opens new insights for the development of disaster disciplines and opens access to the development of disaster history studies in developing countries, especially in Indonesia.

ICDMM-2219

MODELING OF COASTAL AREA MANAGEMENT BASED ON CLIMATE CHANGE ADAPTATION IN BENGKULU CITY

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Climate change has had impacts on the environment and society. The delay in adaptation efforts will result in direct and indirect economic losses for Indonesia in 2100 of 2.5% of Gross Domestic Product (GDP). Changes in climate change indicators such as surface temperature, rainfall (CH), sea surface Temperature (SPL), sea level (TML), extreme climate events (ENSO, IOD/DMI, PIO/IPO) and extreme weather events (heavy rains, strong winds, and storm surges) will cause various potential impacts on related fields in the national development system, both in terms of the economy, livelihoods, ecosystems, and special areas specific regions). Another impact, an increase in the frequency of occurrence of hydrometeorological disasters. This study focuses on the vulnerability of coastal areas by using multiple decision-making methods and geographic information systems and remote sensing. The relationship between demography and climate change was tabulated using the Chi Square method. Observations were made on 19 sub-districts in the city of Bengkulu. An appropriate strategy is needed to adapt to vulnerability, especially in coastal areas.

NUMERICAL STUDY OF PERFORATED STEEL PLATE SHEAR WALL UNDER STATIC MONOTONIC LOAD

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Steel plate shear wall is an alternative structural system to resist the lateral force during earthquake. Tension mechanism may develop on steel plate shear wall if a steel frame, where the shear
wall attached, deformed laterally and the angle of beam and column joint changed. In this paper, numerical study using MSC Nastran software was conducted for a stand-alone perforated steel plate shear wall without frame. The size of shear wall's numerical model was 900 mm x 900 mm which refer to the size of experimental specimens. All edge of the shear wall were constrained to out of plane deformation. The bottom side was fixed and the upper side was enforced to displace through displacement control scenario. The shear wall was perforated for 6 different effective areas with two different plate thicknesses. A true stress-true strain material model was applied in the simulation. Skew-diagonal waves pattern was observed on the shear wall which the diagonal zone had the maximum stress and determined the ultimate condition of the shear wall. Load resistance at 4% drift ratio for different perforated areas was compared. It is found that for two different plate thickness, the load resistance was decreased proportionally to the effective area of the shear wall.

READINESS ANALYSIS OF PUBLIC BUILDINGS IN PADANG CITY FOR TSUNAMI TEMPORARY EVACUATION SHELTER

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ABSTRACT

The potential mega earthquake at Mentawai Megathrust could trigger deadly tsunami. The tsunami can reach Padang City within 20-30 minutes. Thus, people in Padang City needs to be evacuated immediately either to the higher ground or to the high-rise buildings located in Padang City. Reaching higher grounds is not easy as it takes time and hampered by traffic. Therefore, vertical evacuation to the high-rise buildings is very important to be studied. This paper aims to identify, analyze and measure the
readiness of the potential buildings to be used as temporary evacuation shelters for tsunami disaster evacuation. The research was conducted using observation to twenty-three potential buildings and interviews. The readiness of the buildings is assessed using 23 criteria, which were divided into 6 main criteria and 17 supporting criteria. It was found that none of the building was ready as tsunami evacuation shelter. In order to be ready as tsunami evacuation shelter, 7 buildings that meet all 6 main criteria need to improve their supporting facilities and infrastructure, while other 16 buildings has to be improved to meet all the main and supporting criteria.

ICDMM-279

IMPACTS OF COVID-19 PANDEMIC IN WEST SUMATRA PROVINCE

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ABSTRACT

The first case of Covid-19 in West Sumatra was detected in 16 March 2020. The impact of the pandemic is very severe and not just limited to health sector, but to social and economic aspects as well. Even construction sector is also affected. This paper aims to investigate the impact of Covid-19 pandemic in West Sumatra Province, Indonesia. The methodology adopted is by conducting literature review on academic paper, and data was acquired by visiting government official website and news in online newspaper using Covid-19 pandemic impact keywords. The data was analysed using content analysis by deploying NVivo software. It was found that the Covid-19 pandemic has significant impact at health, social, and economic sector in West Sumatra. As of 4 September 2021, the number of positive cases of Covid-19 in West Sumatra was
87.373 and the total death was 2018. Almost half of the positive cases originated from the Padang City. Economic was contracted and the total income of the population was decrease. Education process was also disrupted due to the online system. Parents needs to assist their children and at the same time worried that their children would not be able to meet the level of knowledge and skills required. In construction sector, due to budget refocusing many construction projects have to be postponed.

STUDY ANALYSIS OF ASLIDE VULNERABILITY IN THE SUB-DISTRICT OF LEMBAH GUMANTI, SOLOK REGENCY (JALAN LUBUK SELASIH – SURIAN)

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ABSTRACT

Open access land mining activities on the Lubuk Selasih – Surian national road have resulted in floods and landslides that have resulted in losses to the community and the imposition of costs for maintenance and rehabilitation of federal roads along the mining area. This study aims to determine the existing condition of mining and analyze the vulnerability of landslides in mining areas. The data used is secondary data, using descriptive quantitative methods with photogrammetric analysis of the maps obtained. The results showed that this mining area has the characteristics of rocks that are easily crushed and tend to be unstable, as well as steep and very steep slopes. This area is also located on the active Semangko fault and volcanic mountains. The environmental carrying capacity of disaster prevention and protection ecosystem services is mainly in the shallow categories. Based on these findings, the mine site is at a very high level of vulnerability to landslides. Thus, it is necessary to mitigate mining management
administratively and operationally to minimize environmental damage.

THE TRAFFIC FLOW CHARACTERISTICS ANALYSIS OF THE TSUNAMI EVACUATION ROAD (CASE STUDY: THAMRIN ROAD SEGMENT, PADANG CITY)

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ABSTRACT

Padang City a city located along the west coast of Sumatra, which is very vulnerable to tsunami disasters. If there is an earthquake with the potential for a tsunami, people living along the coast must be evacuated to higher ground. People evacuation process to avoid the tsunami disaster to a safe area will use several roads as evacuation routes. When evacuating, the movement of people and the existing traffic flow will influence each other to form new traffic characteristics. Therefore, this study aims to determine the characteristics of traffic flow, namely the volume and speed of existing conditions and at the time of evacuation during peak and offpeak hours. In this study, the 2014 Indonesian Capacity Guidelines were used as a reference. The traffic volume survey was conducted on August 23, 2021, at 5 points at the study area (2 sections, 3 intersections). For microscopic analysis of traffic, VISSIM software was used. From the results of the analysis, peak hours occur at 06.45-07.45 WIB (3657 pcu) while the off-peak time is at 10.15-11.15 WIB, (1987 pcu). During peak hours, the vehicle speed on the existing road section is 34 km/hour. With the prediction of movement during evacuation of 2476 pcu, there was a significant decrease in speed in the road segment, when residents evacuated. The road widening to 2.5 meters must be carried out so that residents can move at a speed of 5 km/hour along the evacuation process.
THE IMPACT OF THE PANDEMIC ON THE PERFORMANCE OF PUBLIC TRANSPORT SERVICES (CASE STUDY: PUBLIC TRANSPORTATION IN PADANG)

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ABSTRACT

The Covid-19 pandemic that has hit the world today has had an impact on the transportation sector, including public transportation in the city of Padang. The Covid-19 disaster has caused many transportation business sectors in the city of Padang to not operate. This study aims to evaluate the performance of public transportation in the city of Padang due to the covid-19 disaster. The survey method used is a static survey on roads, to determine the quantity and quality of public transport services while operating on each route. Data analysis was carried out to obtain an analysis of the results of the performance of public transportation services in the city of Padang. The results showed a decrease in the average frequency of public transportation from before to the time of the pandemic by 55.60 percent, the average headway of public transportation increased from before the pandemic to the time of the pandemic by 34 minutes, the load factor of public transport passengers from before to the time of the pandemic. During the pandemic, it decreased by 15.48 percent and the average level of public transport operations from before the pandemic to the time of the pandemic decreased by 28.34 percent.