

ISBN :



# CONFERENCE PROGRAMS AND ABSTRACT

**ADVANCING SUSTAINABLE SCIENCE AND TECHNOLOGY  
THROUGH EFFECTIVE COLLABORATION**

**OCTOBER 20-21, 2021**

**Palembang, Province of South Sumatera  
Indonesia**

Organized By :



## FOREWORD FROM GENERAL CHAIR 5<sup>th</sup> FIRST 2021 INTERNATIONAL CONFERENCE



Assalamu'alaikum wr wb,

Alhamdulillahirobbil 'alamin, Thank to the God, almighty, due to His bless and love, we are granted good health and opportunity so that we can meet here in the event of the 5<sup>th</sup> FIRST and the 3<sup>rd</sup> SNAPTEKMAS 2021.

The honorable keynote speakers of the 5<sup>th</sup> FIRST and the 3<sup>rd</sup> SNAPTEKMAS 2021

Dra. Nana Yuliana, MA., Ph.D., as The Indonesian LBBP Ambassador for the Republic of Cuba, concurrently with the Commonwealth of the Bahamas, Jamaica, the Dominican Republic and Haiti

Prof. Ramaraj Boopathy. from U Alcee Fortier Distinguished Service Professor of Biological Sciences At the Nicholls State University, USA

Dr. Ing. Ahmad Taqwa, the Director of State Polytechnic of Sriwijaya.

The honourable keynote speakers, distinguished guests, all participants, ladies and gentlemen,

For the beginning of my speech, let me welcome all of you with my great warm hug. It is a great honor for me that you choose the 5<sup>th</sup> FIRST and the 3<sup>rd</sup> SNAPTEKMAS 2021 as your conference. I am so proud that the authors still become enthusiastic to develop the knowledge although in this pandemic situation. Let us still work hard to support the development of the world through the research, science, and technology in many parts of the knowledge, as what has been purposed by the FIRST conference itself.

In this occasion, I would like proudly to inform you that the 5<sup>th</sup> FIRST and the 3<sup>rd</sup> SNAPTEKMAS 2021 as the forum to share knowledge, to search, to find, and to enlarge the link with other industries and universities has attracted so many authors from abroad, such as from: Politeknik Tun Syed Nasir Syed Ismail; MARA University; Politeknik Mukah Sarawak; University Sultan Zainal Abidin, Terengganu, Malaysia; Politeknik Melaka (PMK) Malaysia; Iloilo Science and Technology University (ISAT-U) Philipina; Politeknik Kota Kinabalu; Universiti Teknologi Malaysia; The National University of Malaysia; National Chin-Yi University of Technology (NCUT); Accounting Research Institute UiTM-Malaysia; Management and Science University Malaysia; AlBaha University, KSA, Saudi Arabia; Politeknik Melaka (PMK), Malaysia; Kuantan Community College, Pahang, Malaysia; Universiti Brunei Darussalam; and Ferdowsi University of Mashhad, Iran.

Welcome to all of the researchers that become the collaborators in our research and community service. It is our great honour to have you as our collaborators and participants in the 5<sup>th</sup> FIRST and the 3<sup>rd</sup> SNAPTEKMAS 2021.

The honourable keynote speakers, distinguished guests, all participants, ladies and gentlemen,

In this chance, I would like to say thank you very much to the Director of State Polytechnic of Sriwijaya for his full support in the development of the Research and Service Community programs. Due to his hard work and his belief to all of the committee so that this event can be held.



In this occasion, I also would like to convey my big thank to all of the keynote speakers, invited guests, all the participants, all reviewers, and all committee of the 5<sup>th</sup> FIRST and the 3<sup>rd</sup> SNAPTEKMAS 2021. Without you all, this event will be nothing. May Allah SWT gives His reward for your sincerity. As the time goes by, it is hoped that our cooperation and coordination in the FIRST and SNAPTEKMAS can be maintained and improved. I hope that you can enjoy this conference and can get a big benefit from this event. I also wish that we can meet again in the forthcoming FISRT ad SNAPTEKMAS

Wassalamu'alaikumwaraahmatullahi wabarakatuh

## FOREWORD FROM DIRECTOR OF STATE POLYTECHNIC OF SRIWIJAYA



The honorable, FIRST 2021 and SNAPTEKMAS 2021 keynote speakers,

Dra. Nana Yuliana, MA., Ph.D., as The Indonesian LBBP Ambassador for the Republic of Cuba, accredited to the Bahamas, Republic of Dominican, Republic of Haiti and Jamaica

Prof. Ramaraj Boopathy., from U Alcee Fortier Distinguished Service Professor of biological sciences at the Nicholls State University, USA

Dr. Ing. Ahmad Taqwa, MT., as Director of Politeknik Negeri Sriwijaya

Assalamualaikum wr wb,

Let us extend our gratitude to Allah SWT, the most gracious, the most merciful. Due to His bless, we can gather here, at the Opening Ceremony of the FIRST 2021 and SNAPTEKMAS 2021

First of all, Please let me deliver my warm welcome to all keynote speakers and all participant of FIRST 2021 and SNAPTEKMAS 2021. It is my great pleasure to meet and see you in this event.

Although, there are so many obstacles that should be faced in the pandemic situation, however, as young generation, we should be optimistic, stay strong and be active in searching and finding the solution. The FIRST 2021 and SNAPTEKMAS 2021 as the DIES of State Polytechnic of Sriwijaya annual event will become one of the media to support those activities. The researchers could share knowledge, find partners, and enlarge the collaboration through this event.

Based on the change in the model of the teaching learning activity that focuses on the MERDEKA BELAJAR, State Polytechnic of Sriwijaya has a big desire in getting acceleration in the internationalization of the institution. One of them by improving the overseas and industrial collaboration, especially in joint research and joint publication. In the beginning of 2021, the research and community service unit in Politeknik Negeri Sriwijaya has launched new schemes of research and community service, namely the Overseas Collaboration Research and Overseas Collaboration Community Service. Thanks to God, those schemes have attracted researchers not only from Asia but also several other countries outside Asia, such as: research and community service collaboration with Al Baha University from Saudi Arabia, with Ferdowsi University of Mashhad from Iran, and with Princess Sumaya University of Technology from Jordan, as well as several other foreign universities.

In this occasion, I also would like to welcome all the researchers that become the collaborators in our new scheme of research and community service. It is our great honour to have you as our collaborators.

The honourable participants,

At this time, State Polytechnic of Sriwijaya has held 5 times of FIRST. FIRST publications from previous conferences have been successfully indexed not only in SCOPUS, but also in WOS. This 5th FIRST seminar will be conjugated with the 3<sup>rd</sup> National Seminar on Community Service SNAPTEKMAS. (National seminar of applied technology for public). All of these are the efforts to improve the quality of Polsri lecturers which significantly have a positive effect on the learning process of Polsri students.

Before ending my speech, I would like to congratulate the participants of The FIRST 2021 and SNAPTEKMAS 2021. May the noble efforts, support, and cooperation of researchers in this conference will continue. Special thanks to the organizer and co-organizer committee of The FIRST 2021 and SNAPTEKMAS 2021 for the hard work and the commitment in realizing this conference. Do maintain the spirit of working in a team and continue to unite in order to display a culture of excellence in the eyes of the country and the world.

With Bismillahirrahmanirrahim, I officiate The FIRST 2021 and SNAPTEKMAS 2021.  
Wassalamu'alaikum warrahmatullahi Wabarakatu

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# Utilization of Remote Sensing Technology for Flood Distribution in Palembang City Web-based

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## ABSTRACT

Construction that continues to be carried out in the city of Palembang, will result in changes to existing land use, more and more swamp areas are stockpiled to build buildings on them, this can certainly have an impact on the reduction of water catchment areas, with the result that when it rains it frequently results in inundation of water in several areas in Palembang City. In the development plan carried out certainly information is needed on flood-prone areas that are spread throughout the city of Palembang, so that a web that can be accessed easily by everyone who needs data on flood distribution areas is needed. The flood distribution map is classified based on interpretation results using remote sensing methods, namely towards inundation, land cover, land slope and rainfall. From the results of the analysis, there are 5 classifications of flood vulnerability levels in the city of Palembang namely a very high level of vulnerability of 16.88 km<sup>2</sup>, a high level of vulnerability of 888.53 km<sup>2</sup>, medium vulnerability of 110.03 km<sup>2</sup>, a low level of vulnerability of 92.73 km<sup>2</sup> and not vulnerability of 58.39 km<sup>2</sup>. Furthermore, the flood distribution map is entered into the flood distribution website which has been designed based on the flood distribution in Palembang City.

**Keywords:** Remote Sensing, Flood, Palembang, WEB-based

## 1. INTRODUCTION

Palembang City is the capital city of South Sumatra Province, located between 2°52'3°5' South Latitude and 104°37'104°52' East Longitude. Administratively, the city of Palembang has 18 districts and 107 ward, with an area of 100.61 km<sup>2</sup> [3]. Construction that continues to be carried out in the city of Palembang, will result in changes to existing land use, more and more swamp areas are stockpiled to build buildings on them, this can certainly have an impact on the reduction of water catchment areas, with the result that when it rains it frequently results in inundation of water in several areas in Palembang City [7].

Floods in the city of Palembang are not only caused by reduced land area but also due to insufficient drainage capacity, river silting. Changes in flood area in Palembang City can open up the use of remote sensing technology [1][2][6][9][11]. Several studies use land use factors, rainfall, land slope, and topography in determining the flood-prone areas [5][12][13]. Changes in land use certainly have a connection with the intensity of floods that occur in the city of Palembang, where the less air catchment areas will cause an increase in the

intensity of floods that occur [4]. Likewise rainfall, an increase of rainfall in an area will cause high flood susceptibility in that area [8][12]. Land slope factors and topography will also affect flood vulnerability in an area, an area that has a low topography will certainly be more prone to flooding [13].

In the development plan carried out, information is needed on flood-prone areas scattered throughout the city of Palembang, so that a web that can be easily accessed by everyone who needs data on flood distribution areas is needed [10]. From the mentioned background, it is necessary to conduct research on the distribution of floods in the city of Palembang based on a web so that it is easier to obtain information on flood-prone areas in the city of Palembang.

## 2. METHODOLOGY

The research was conducted in the city of Palembang which consists of 18 districts and 107 ward and is directly adjacent to Banyuasin Regency in the north, east and west, while in the south is bordered by Muara Enim Regency and Ogan Ilir Regency. The research study area can be seen in Figure 1.

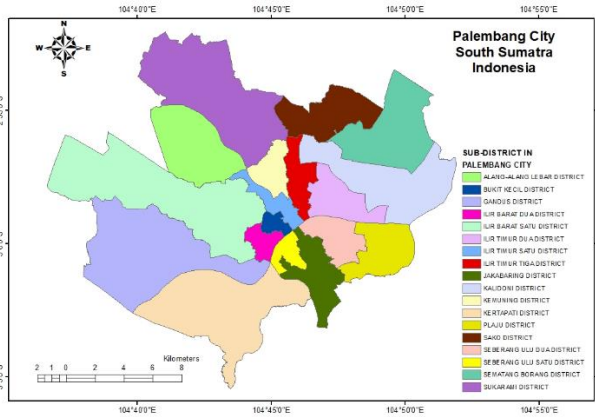


Figure 1. Research Area in Palembang City

The research stages consist of: (i) overlay thematic maps of inundation, land cover, land slope, and rainfall, (ii) website application design, (iii) implementation (insert data and maps to the website), (iv) field test, (v) Palembang city flood distribution website.

### 3. RESULT AND DISCUSSION

#### 3.1. Classification and scoring of inundation, land cover, land slope, and rainfall

Entirely thematic maps starting from land cover maps, inundation maps, land slope maps, which are obtained from the interpretation results using remote sensing methods and rainfall maps that already have a score on each classification will be weighted, where each map reviewed has the same weight value which is 25%, this is caused by the components reviewed have the same opportunity in causing flooding in an area.

Maps of classification and scoring of inundation, land cover, land slope, and rainfall can be seen in Figures 2 to 5.

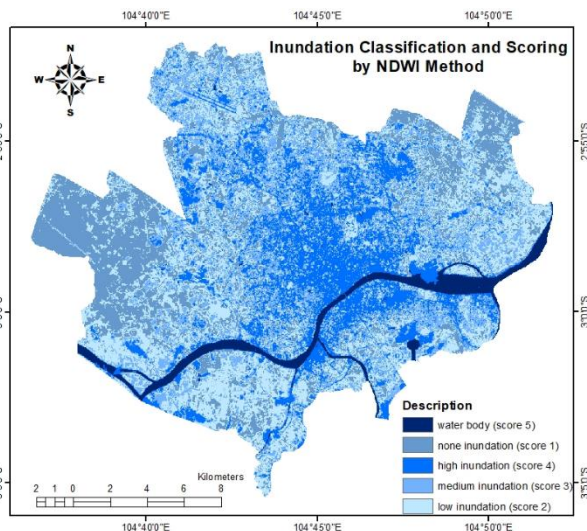


Figure 2. Inundation Classification and Scoring Map

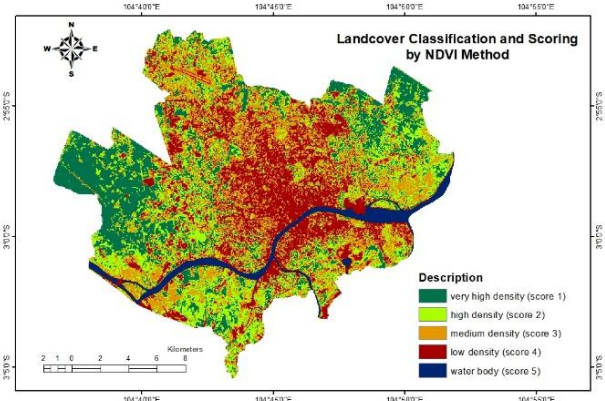


Figure 3. Land Cover Classification and Scoring Map

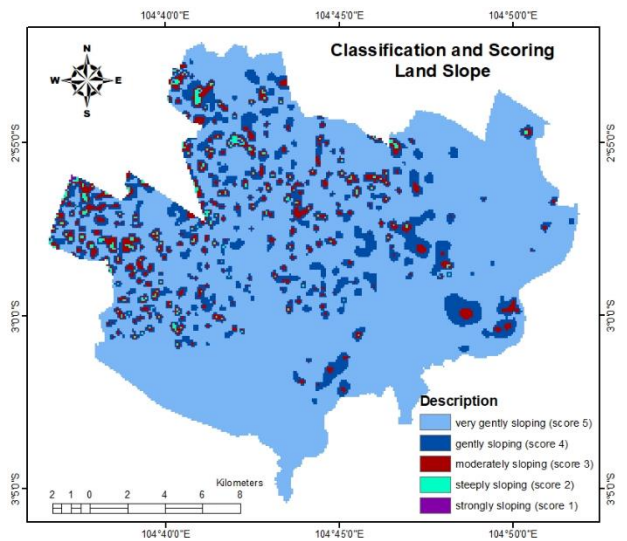


Figure 4. Land Cover Classification and Scoring Map

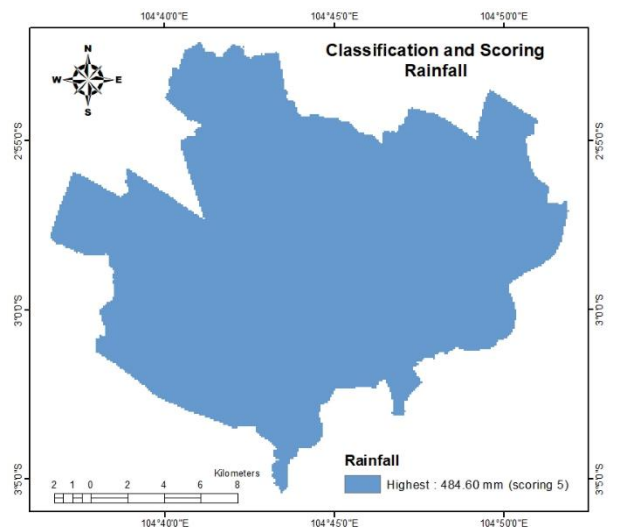
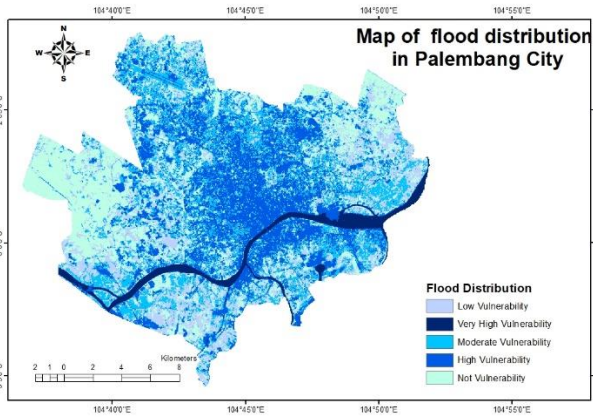


Figure 5. Rainfall Classification and Scoring Map

Map of flood distribution in Palembang City from the results of weighting and map overlays can be seen in Figure 6.



**Figure 6.** Map of Palembang City Flood Distribution

Furthermore, this flood distribution map will be included in the flood website that will be designed.

**3.2. Website application design**

The design of the flood website application begins with the login page. On the login page there are 2 entries that must be filled in order to enter the main page, namely the registered email and password. If user do not have a registered email and password, they must register an account first by pressing the Register button on the login page, as shown in Figures 7 and 8.

To register an account, there are 6 entries that must be filled, namely full name, telephone number, address, agency, email, and password of user. After completing registration, users can continue surfing the flood website to get the distribution of floods in Palembang City.

**LOGIN**

Siapkan Login

Email

Password

**Login**

Belum ada akun?

Daftar

**Figure 7.** Login Page

**REGISTRASI AKUN**

Siapkan Daftar

Nama Lengkap

No. Telp

Alamat

Instansi

Email

Password

**Daftar**

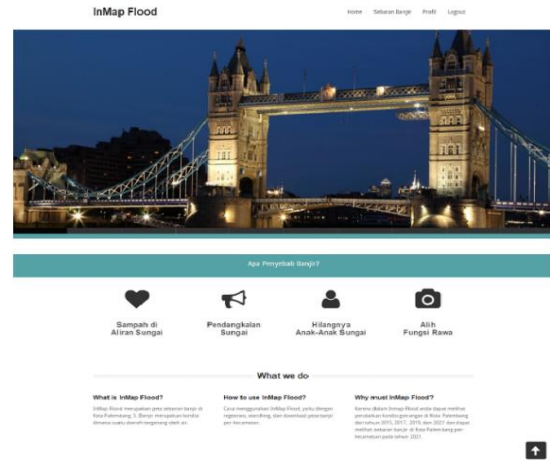
Sudah punya akun?

Login

**Figure 8.** Registration Page

**3.2.1. Home Page**

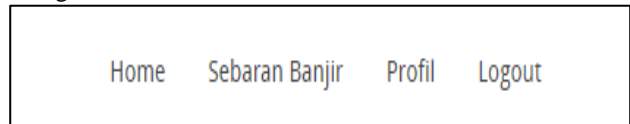
On the home page there are photos, an explanation of the causes of flooding, an explanation of what InMap Flood is, how to use InMap Flood, and why user should choose InMap Flood. The Home page can be seen in Figure 9.



**Figure 9.** Home Page

**3.2.2. Navigation Bar Menu**

On the navigation bar menu, there are 4 options, namely Home, Flood Distribution, Profile, and Logout. The Home button is used to display the home page. The Flood Distribution button is used to display the list of cities/districts of flood distribution. The Profile button is used to display the page of profile detail, edit profile, and change the password account. The Logout button is used to log the user account out.



**Figure 10.** Navigator Bar Menu

**3.2.3. List of City and District Page**

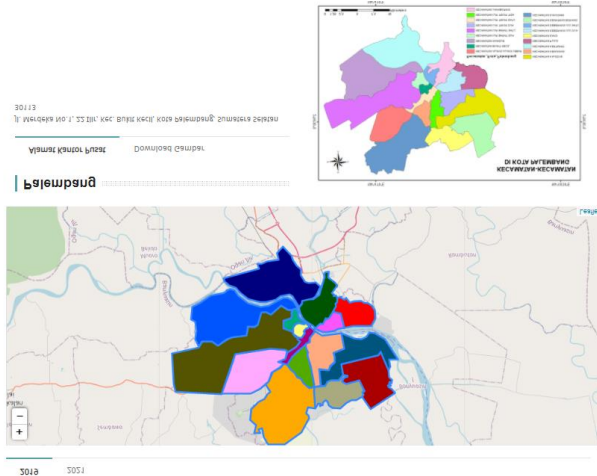
On this page displays a list of the cities and districts in the city. Users can search for the cities by typing name of the city in the search box on the top right. Users can also group the list by city or district by pressing the City or District button. To display the details of the city or district that want to be seen, press the Details button in the middle of the photo of the city/sub-district want to be selected.



**Figure 11.** List of City and District Page

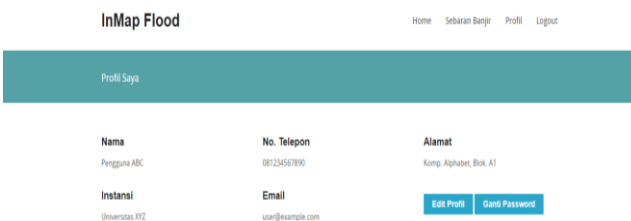
**3.2.4. Detail of City and District Page**

On this page displays detailed information from the city/district which includes maps and photos of the flood distribution, and the address of the mayor's/district office. If the user selects city details, then user can select detailed information by year. Users can also download photos of flood distributions by pressing the Download Image button.



**Figure 12.** Detail of City and District Page

**3.2.5. Profile Page**



**Figure 13.** Profile Page

On this page displays user profile details when registering. Users can access their profiles by pressing the Edit Profile button. Users can also change their account passwords by pressing the Change Password button.



**Figure 14.** Edit Profil on Profile Page

The profile edit form will appear if the user presses the Edit Profile button. Users can change their name, phone number, address, agency, and email.



**Figure 15.** Change Password Account on Profile Page

The change password form will appear if the user presses the Change Password button. The user must enter the old password first to change the password.

From the stages of using the web above, it is expected that users who need data on the distribution of floods in the city of Palembang can easily access the locations of the distribution of floods in the districts of the city of Palembang, ranging from very high vulnerability, high vulnerability, medium vulnerability, low vulnerability, and not vulnerable flood. Information on this potential flood area will be highly needed in regional planning, road planning, land purchase planning, and so forth.

**3.3. Discussion**

Previous research on determining the distribution of floods using a geographic information system [8][9][11][12][13] was not followed up with the creation of a WEB so that information about the distribution of floods was more difficult to access by the general public. With this flood web, all parties can access the flood distribution web site in Palembang City.

**4. CONCLUSIONS**

From the results of the analysis, there are 5 classifications of flood vulnerability levels in the city of Palembang namely a very high level of vulnerability of 16.88 km<sup>2</sup>, a high level of vulnerability of 888.53 km<sup>2</sup>,

medium vulnerability of 110.03 km<sup>2</sup>, a low level of vulnerability of 92.73 km<sup>2</sup> and not vulnerability of 58.39 km<sup>2</sup>. Furthermore, the flood distribution map is entered into the flood distribution website which has been designed based on the flood distribution in Palembang City.

## ACKNOWLEDGMENTS

Thank you to Politeknik Negeri Sriwijaya for funding the assignment research scheme from the Politeknik Negeri Sriwijaya DIPA funding.

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