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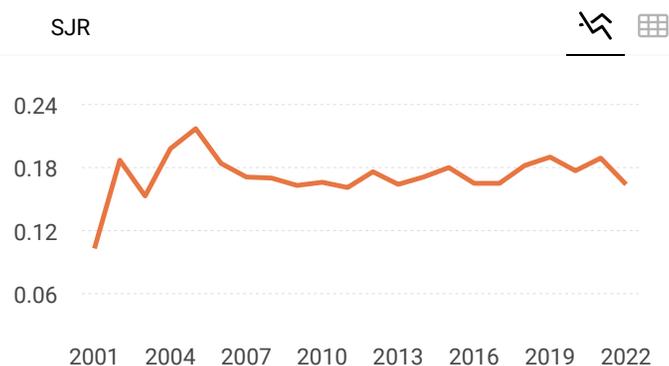
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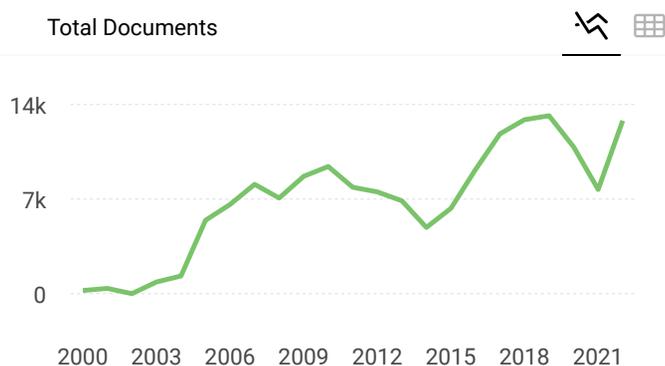
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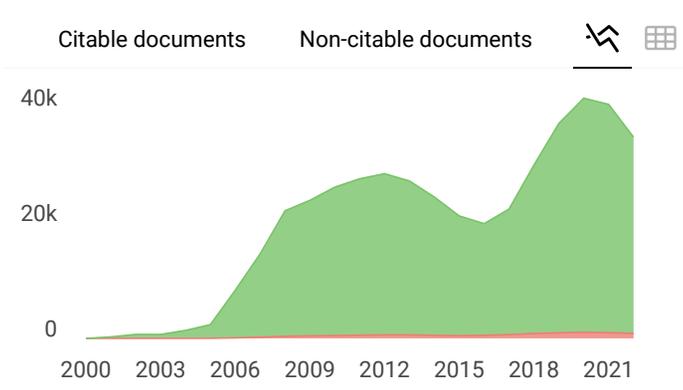
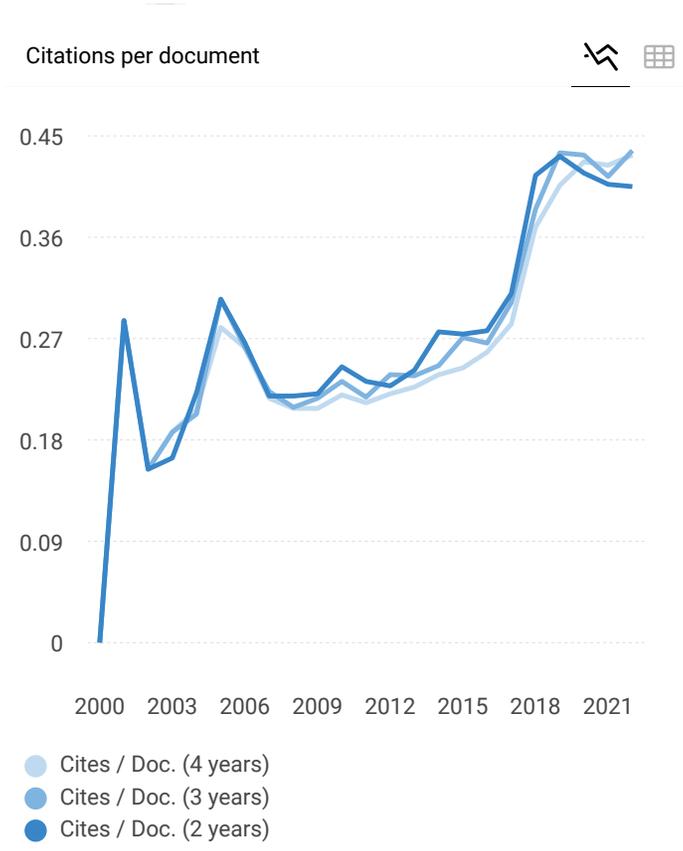
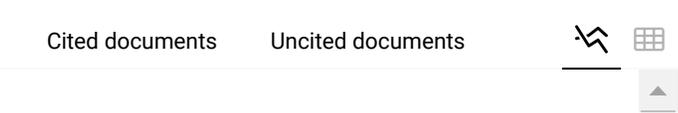
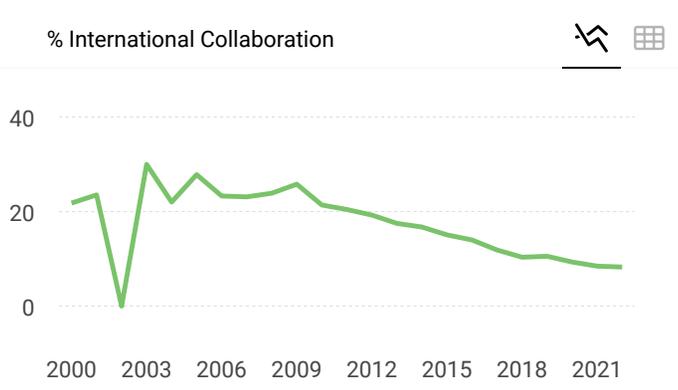
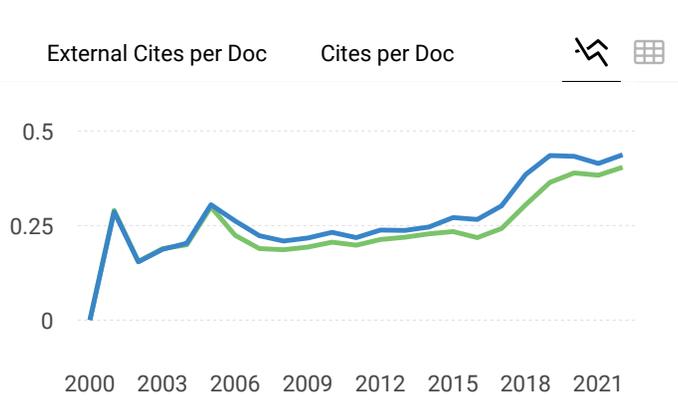
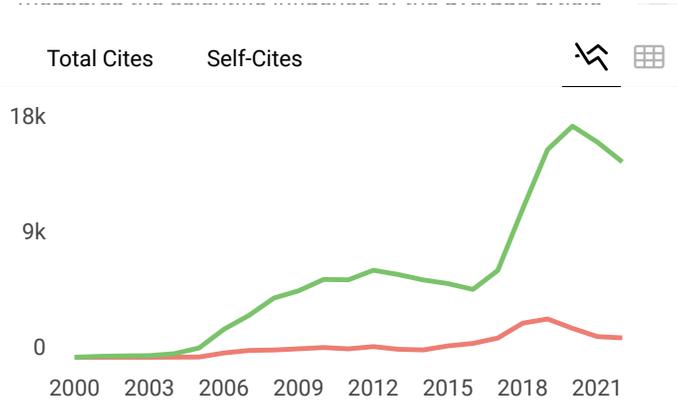
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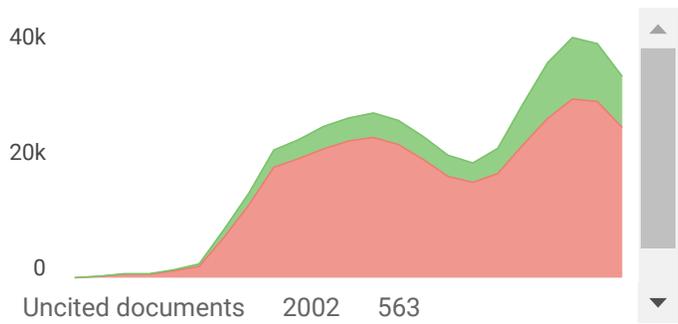


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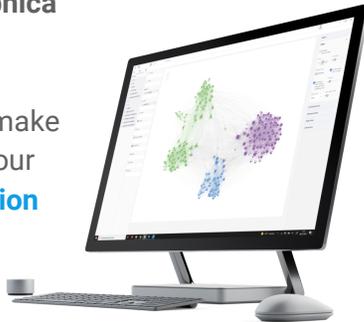


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## PREFACE

The 6<sup>th</sup> International Conference on Energy, Environment, Epidemiology and Information System (ICENIS) 2021, with a theme “*The Impacts of Covid-19 Pandemic on Water, Environment, Energy, Epidemiology, Information System and Strategies for their Adaptation and Mitigation*”. This conference is expected to designate an interactive international forum to provide a platform for sharing and exchanging information on the latest research on energy, environment, epidemiology, and information system. The ICENIS was conducted annually by the School of Postgraduate Studies Diponegoro University, Semarang, Indonesia, to stimulate collaboration between researchers, government, and industries to increase community welfare. This conference also facilitates the formation of a network among participants to enhance the quality and benefit of research and development. Although the current situation is uncertain due to the pandemic COVID-19, however, the conference is rich and varied, with 10 keynote speakers who came from 5 continents: South Africa, America, Australia, Asia (Indonesia, Malaysia), and Europe (Netherlands). The 426 papers were presented via online conference within 14 parallel oral sessions each day (4-5 August 2021) that come from various countries, i.e. Japan, Czech Republic, Algeria, Sudan, Uganda, Malaysia, Tanzania, Timor Leste, West Africa, Turkey, Uzbekistan, Taiwan, United Kingdom, and the United States, and from all over Indonesia consisting of researchers, lecturers, practitioners, post and undergraduate students belonging to various institutions. There were 150 articles selected to be published in the conference proceeding on the topic of Energy, Environment, Epidemiology, and Information Systems. We would like to express our gratitude to all authors, members of scientific committee, and members of organizing committee for their contribution to the success of the conference.

The Editors  
Prof. Dr. Tri Retnaningsih Soeprbowati  
Dr. Budi Warsito  
Dr. Thomas Triadi Putranto

## CONFERENCE PHOTOGRAPH



Welcome speech Chairperson Organizing committee: Prof. Tri Retnaningsih Soeprbowati



Opening remark by Vice Rector research, innovation, and collaboration Universitas Diponegoro



## Opening ceremony



Keynote speaker: Prof. Peter Gell, Federation University, Australia



Keynote speaker: Prof. Magaly Koch, Boston University, USA



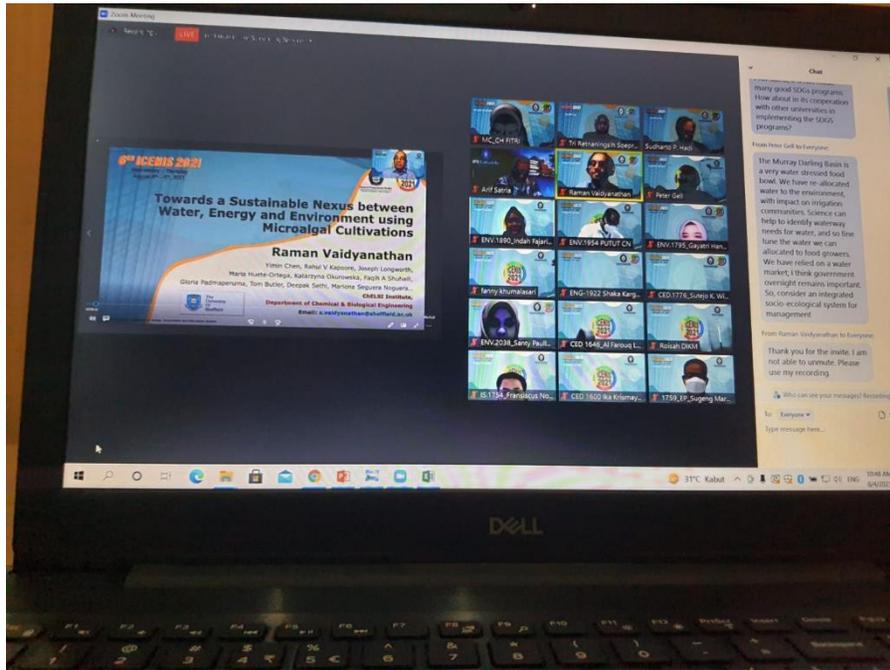
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Keynote speaker: Prof. Wiku Adisasmita  
Indonesian Government Spokesperson for Handling Covid-19



Prof. Arif Satria, Rector of IPB University, Indonesia



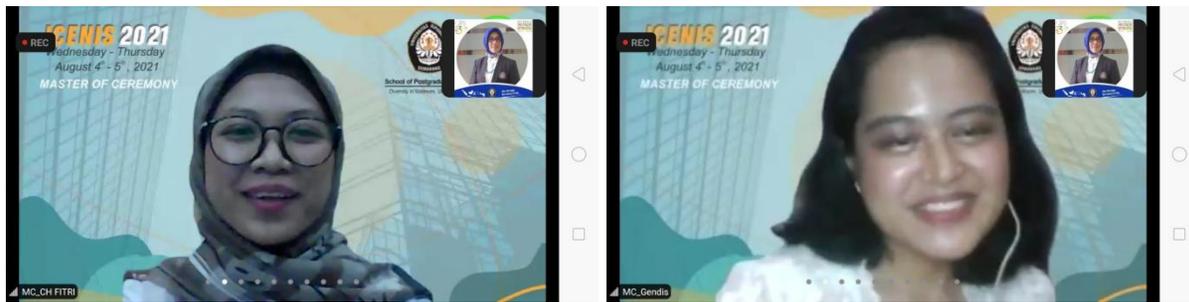
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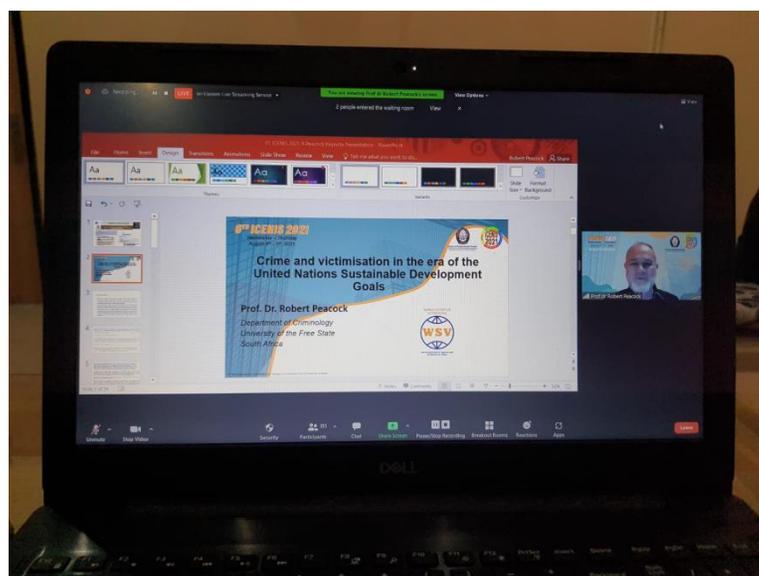
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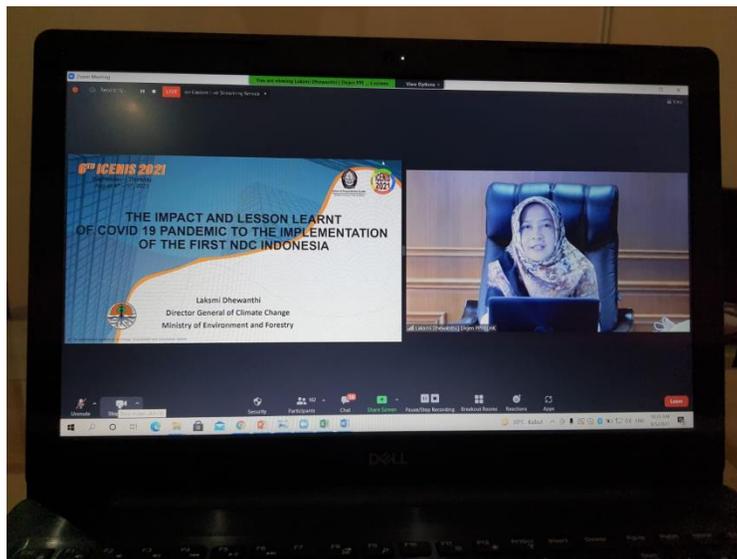
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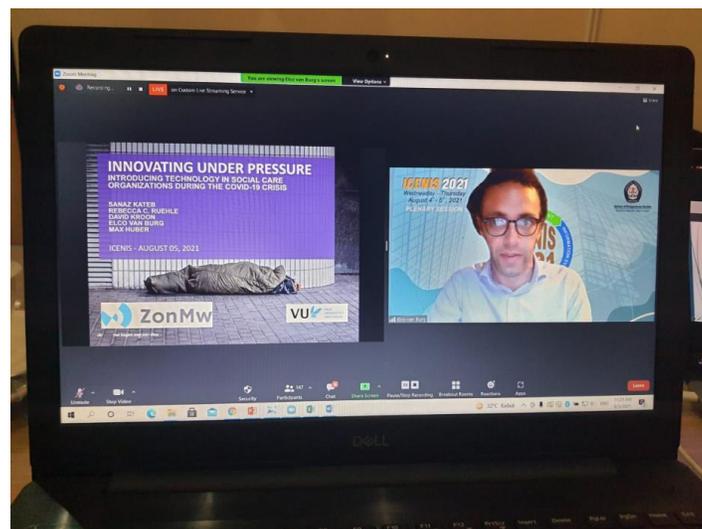
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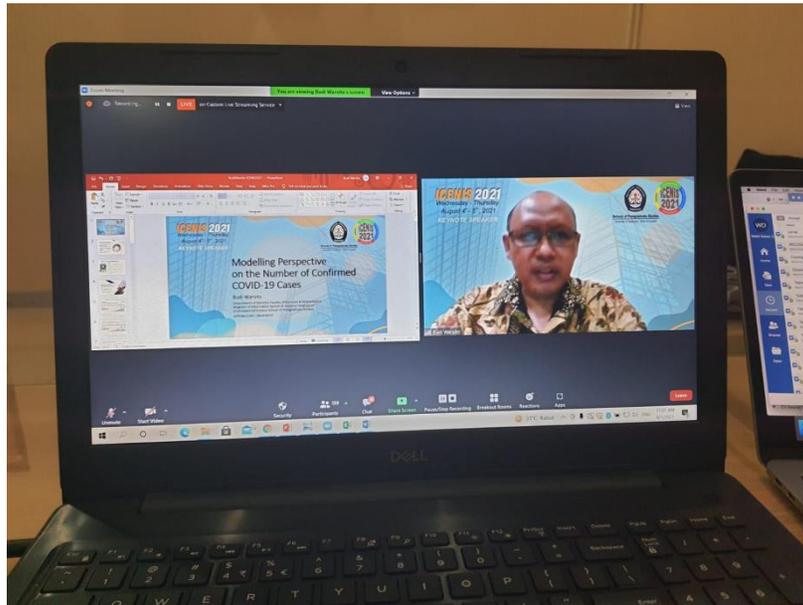
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The Indonesian Ministry of Environment and Forestry (Director Generale Climate Change)



Keynote speaker Prof. Elco van Burg, School of Business and Economics Vrije Universiteit Amsterdam



Keynote speaker Dr. Budi Warsito, School of Postgraduate Studies, Universitas Diponegoro, Indonesia



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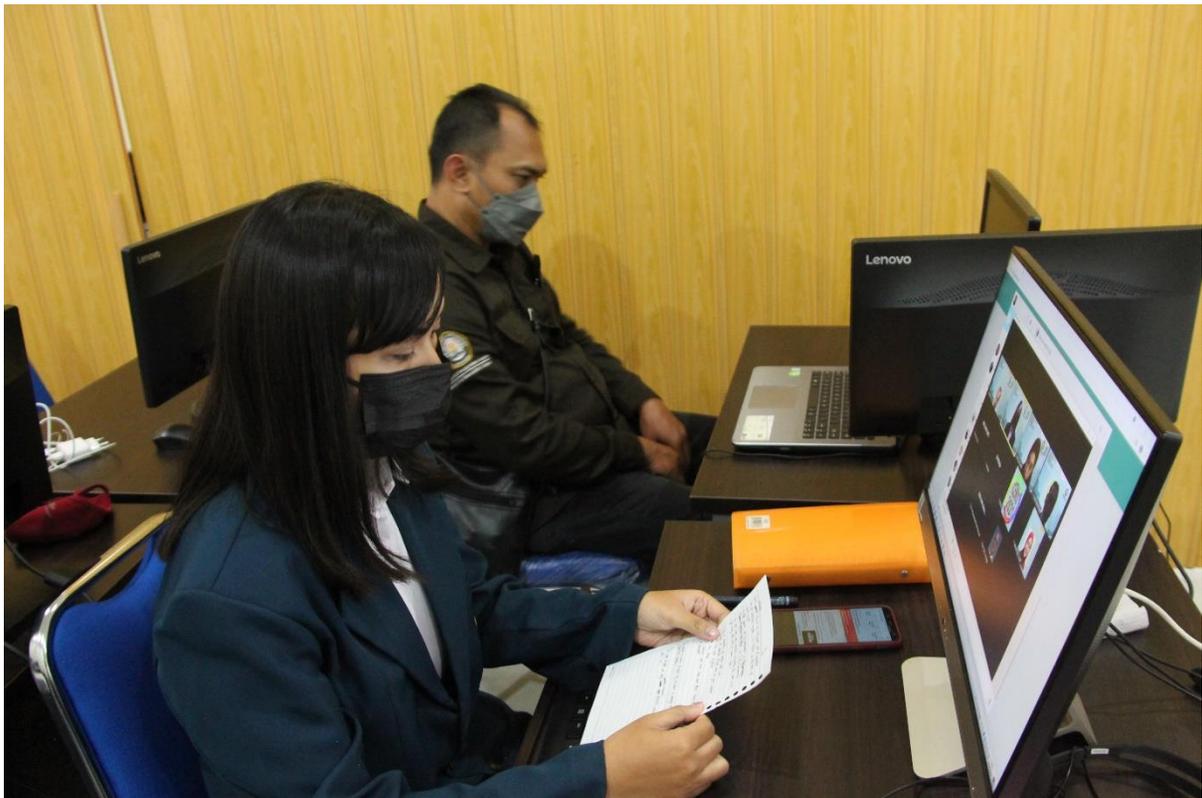


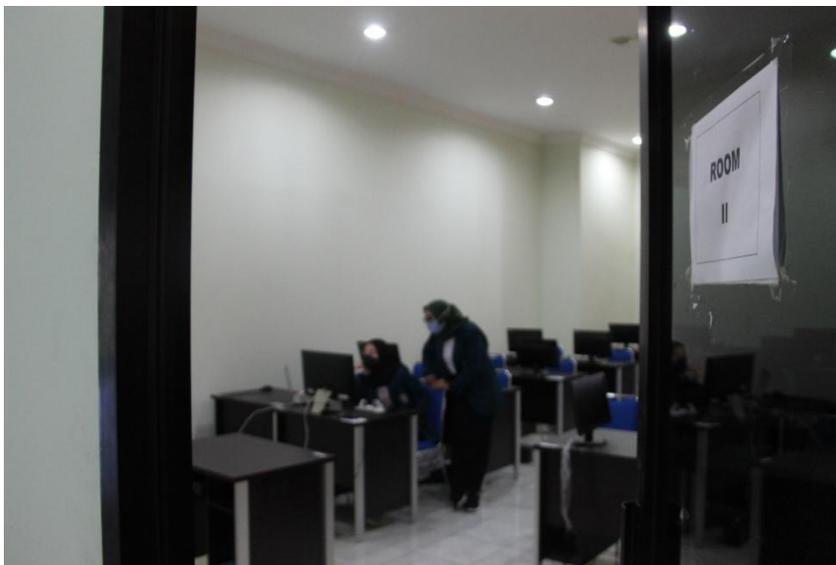
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# The Model of Requirements Planning of Building Development Based on User Needs

Hery Suliantoro <sup>a)</sup>, Anita Rustanti, and Arfan Bakhtiar

Engineering Faculty, Industrial Engineering Department, Diponegoro University, Semarang, **Indonesia**

<sup>a)</sup> Corresponding author: [suliantoro\\_hery@yahoo.com](mailto:suliantoro_hery@yahoo.com)

**Abstract.** The provision of building facilities for the government is one of the supporting factors for improving the performance of public services. Likewise, state universities are one of the government institutions that play an essential role in increasing the ability and competitiveness of Indonesia. To carry out education, research and community service requires adequate building facilities, one of which is the multipurpose building. This study took the case of planning the construction of the multipurpose building at Diponegoro University. However, the planning process for building construction needs has not been carried out through a structured process and approach considering the proper criteria. This condition causes several buildings to have changed their function from the original plan, which causes waste of costs because renovations must be carried out according to changing needs of the users. This study aims to build a needs planning analysis model through the Quality Function Deployment (QFD) method approach and the Kano Model to translate user needs into a building specification to align with the user's needs. As a result, the most important criteria for constructing a multipurpose building are the exterior and interior appearance of the facility as well as the planned construction implementation schedule. The essential criteria are construction costs, operating costs and building depreciation costs.

## INTRODUCTION

State Universities in Indonesia must organize education, research and community service. In order to increase the nation's competitiveness in the face of globalization in all fields, higher education is needed that is capable of developing science and technology.

According to increasing needs for facilities to accommodate student activities, in 2019, Diponegoro University, as one of the State Universities in Indonesia, plans to build a Multipurpose Building with a total building area of  $\pm 34,500$  m<sup>2</sup>. *Multipurpose Building* is a building that can be used by the public for various purposes and meets existing criteria in a particular context or is related to the primary function of the building by the capacity of the building [1]. Designing a multipurpose building combines various activities in a flexible building. It takes notice of various things such as the environment as a physical integration and integration with the functions of existing components. The building has a capacity of between 5000-8000 people, is planned to be used for university graduation activities, conventions, exhibitions, indoor sports, robotics competitions, shows/performances, public lectures, wedding events, etc., and also provides supporting facilities such as a student activity centre, retail, restaurant / café, co-working space and banking. Based on its function, the Multipurpose Building is included in the type of convention building. *Conventions* are defined as events of associations or societies that offer educational sessions and exhibitions [1]. Renaghan & Kay [2] identify five characteristics of common meeting room facilities used by meeting planners: the meeting room's size, the complexity of the audiovisual quality, the lighting and the climate control, and the price of the meeting room.

The results of interviews by several related parties showed that the construction of government buildings, including those in universities, was often not carried out through a well-planned planning process based on the criteria for user needs. The main result in building construction is customer satisfaction by expectations. Planning a building that does not meet the needs of the user, it will cause the building to be not functional, or its utilization is not optimal and less supportive of achieving organizational goals.

This study aims to build a planning model based on customer needs. Customer needs will be translated into building specifications based on criteria based on economic, environmental and social dimensions. Quality Function

# Extension of the Theory of Planned Behaviour (TPB) to Predict Farmers' Intention to Save Energy

Kamel Mouloudj<sup>1,a)</sup>, Ahmed Chemseddine Bouarar<sup>1,b)</sup>, and Smail Mouloudj<sup>1,c)</sup>

<sup>1</sup>*Department of Commerce, University of Medea, 26000, Algeria*

a) Corresponding author: [kmouloudj@yahoo.fr](mailto:kmouloudj@yahoo.fr)  
b) [shemseddine26000@gmail.com](mailto:shemseddine26000@gmail.com) c) [smail.mouloudj@yahoo.com](mailto:smail.mouloudj@yahoo.com)

**Abstract.** In recent decades, energy consumption by agriculture throughout the world has been rapidly increasing. However, little is yet known about the factors that influence farmers' intentions of energy saving. To this end, a self-administered questionnaire was developed to collect data, and 310 Algerian farmers answered questions based on an extended theory of planned behaviour (TPB) and related it to intentions to save energy. A multiple regression analysis was used to test the hypotheses of the model. This research found that intention to save energy is significantly and positively influenced by attitude, subjective norm, perceived behaviour control (PBC), and environmental awareness of farms. This paper provides a theoretical contribution and presents practical implications relevant to academics and practitioners working in areas related to farming.

## INTRODUCTION

Algeria is among the major countries producing and exporting energy; it abounds a significant energy potential and ranks as the tenth world gas reserves and third in shale gas [1]. It is also the primary natural gas producer in Africa, the second-largest natural gas exporter to Europe. It is among the most significant oil producers in the African continent [2]. However, fossil fuels are still the most important source of electricity generation and the third-largest CO<sub>2</sub> emitter in Africa; Algeria is also highly prone to climate change [3]. Understanding human behaviour-related decisions are paramount to tackle global environmental challenges, for a behaviour change may confer significant difference [4]. In this vein, the Algerian strategy to attenuate global climate change was predicated on the tradeoff between sustainable development and international climate commitments; and the government action program has prioritized promoting renewable energy in the electricity sector to attain an appropriate energy mix [3].

Recently, environmental sociologists have started to pay more attention to people's behaviour and actions regarding preserving environmental and natural resources [5]. Hence, investigating the factors influencing energy-saving behaviour and their mechanisms of action is a critical way to save regional energy and alleviate emissions [6]. Conserving energy behaviour is one of the most critical eco-friendly behaviours because eco-friendly behaviour among people (consumers, employees, or farmers) is highly influenced by environmental and psychological factors such as attitudes and perceived control. However, studies exploring farmers' motivations to save energy are scant, especially in developing countries. Researchers have widely used the theory of planned behaviour (TPB) to explain and explore the psychological factors influencing eco-friendly behaviour. The main essence of the theory suggests that human behaviour is driven by intention, and intention, in turn, is highly influenced by three main factors: attitudes toward the behaviour, subjective norms, and perceived behavioural control [7]. However, although these three factors combined to explain a great deal of intention; several researchers, however, added other factors to strengthen the predictor power of the theory such as perceived resources [8], fear of COVID-19 and trust [9], energy knowledge [10], and environmental concern [11].

Accordingly, the study's main aim was to explore Algerian farmers' intention to save energy from the lens of the theory of planned behaviour by incorporating to the three constructs of the theory a fourth construct, namely environment awareness. Hence, our research paper contributes to the existing body of literature in three ways: first,

# An Analysis of Locational Distribution Between The Commuter-selected Open Spaces and Public Transport Points: A Case Study of Bekasi City and Depok City Indonesia

Mustika K Wardhani<sup>1, a)</sup>, Tomohiko Yoshida<sup>2, b)</sup>, and Alpraditia Malik<sup>3, c)</sup>

<sup>1</sup>Research Organization of OIC, Ritsumeikan University, Osaka, Japan

<sup>2</sup>College of Policy Science Ritsumeikan University, Osaka, Japan

<sup>3</sup>Graduate School of Policy Science, Ritsumeikan University, Osaka, Japan

a) Corresponding author: [mk1698@fc.ritsumei.ac.jp](mailto:mk1698@fc.ritsumei.ac.jp)

b) [tyoshida@sps.ritsumei.ac.jp](mailto:tyoshida@sps.ritsumei.ac.jp)

c) [alpraditia@gmail.com](mailto:alpraditia@gmail.com)

**Abstract.** Since the emergence of Covid-19 in Indonesia in early 2020, access to public spaces such as malls and museums has been limited. An alternative place to spend leisure time is an open area such as city parks, gardens, and squares (in Javanese, this is called *Alun-alun*). The proximity between open spaces and public stopping points can encourage commuters to benefit from integrated city planning. This study aims to conduct comparative research related to suburban infrastructure in the cities of Bekasi and Depok. This study uses mixed research methods with SPSS v26.0 and Arcmap v10.5.1 software to see the distribution of open space locations chosen by commuters who live in Depok and Bekasi and work in the JABODETABEK area. The results indicated that the open spaces selected by suburban commuters are still not integrated with public transportation points, especially in Depok City. From the descriptive statistical analysis, the mode choice preference (X4) shows that private vehicles are still the dominant transportation choice for travelling to open spaces. The findings of this study can be considered in urban design policies related to determining the location of open spaces supported by their proximity to public transport points to promote behaviour change for healthier lifestyles.

## INTRODUCTION

Since Covid-19 was declared a pandemic in early 2020, several policies in Indonesia related to public facilities and transportation have been adjusted according to these uncertain conditions. Cities and public spaces appear empty in lockdowns, and new urban landscapes replace previous ones, transforming the private into the public [1]. The need for social distancing and reducing human capacity in indoor public facilities creates a new paradigm about the roles of outdoor open space. Work from home policies provides flexibility for workers whose previous commuting pattern was from home to the workplace but now includes third places such as cafes or co-working spaces. Also, the trend of the fourth-place concept as a relational place more socially diverse in terms of user groups and social relations is an exciting discourse compared to the third place, which mainly caters to parochial life among socially homogenous groups. The idea of fourth place can also serve as an example in the implication of 'hybrid space' in social distancing schemes. Moreover, the core of the hybrid space concept is the fusion of digital and physical environments [2]. Does the urban policy agenda recognize the possibility of combining the concept of hybrid space with its proximity to public transport in suburban areas?

Reviewing the historical aspects of urban infrastructure in Indonesia, we can learn from the Dutch colonial period, which designed the integration of stations and proximity to open spaces as a buffer zone. During the 1920s,

# Comparing Catastrophes: The Influence of Impacts and Timelines on Prioritising Crises

Peter Gell<sup>1,2, a)</sup>

<sup>1</sup>*School of Science, Psychology and Sport, Federation University, Ballarat, Australia*

<sup>2</sup>*Diponegoro University, Semarang, Indonesia*

<sup>a)</sup> *Corresponding author: [p.gell@federation.edu.au](mailto:p.gell@federation.edu.au)*

**Abstract.** Across time society has been confronted with a wide range of crises that have required measured responses. The COVID-19 pandemic was widely forecast, but governmental preparation was lacking. Even when it was spreading, its risks to society were downplayed in some quarters. The climate change crisis has also been widely forecast, and preparation has been slow, with vested interests also denying the science or downplaying the risk. The pandemic is an acute crisis with rapid onset and highly visible impacts on human life and wellbeing. Through vaccine technology, however, there is a short term and likely effective management measure available. Climate change is a diffuse crisis with long lead times. In contrast to Covid, it has momentum and, once thresholds are exceeded, measures to reverse the change will have limited effectiveness. While the implications of carbonising our atmosphere were known over 50 years ago, the socio-economic response is only now taking hold. The slow nature of this crisis has subdued the political response, and the Earth is now committed to considerable impacts, even if we collectively act decisively now. The gradual nature of this crisis, its opaque direct impacts on humanity, and the scale of its complexity render it a 'wicked' problem that will persist through this century and beyond. Scenarios of impact across multiple quarters assure us that the costs of unabated climate change will result in a global scale crisis, played out in many individual locations for many decades. Aware of this, society is already investing in adapting to the changes that are foreseen while also beginning the process of mitigating carbon emissions to limit the scale of the challenge. In some places, this may mean preparing economies for drier climates, while in others, it may mean a managed retreat from the present coastline. Providing refuge from heatwaves will be a widespread adaptation measure. For nature, its capacity to adapt will be strengthened if the pressure from humans is also mitigated.

## PANDEMICS

Human societies have experienced global crises over the centuries and have endured. They had brought great suffering, particularly when medical science was in its infancy and the means of combating pandemics was rudimentary. In the 21st century, medical science is highly sophisticated. However, the covid-19 outbreak spread rapidly, impacted advanced and developing societies alike through serious illness and morbidity, and brought on a great economic downturn. In some corners, the existence and threat of the virus was denied, and a targeted response was delayed. However, in the decades preceding the emergence of covid-19, there were 'dry-runs' in the emergence of other zoonotic, highly contagious diseases such as SARS and Ebola. There were warnings that a global scale pandemic was likely, yet many nations were poorly prepared.

## VULNERABILITY

In Australia, most infections result from the carriage of the virus into the community from those entering the country through international travel. Historically, Australia had dedicated quarantine stations in which facilities and staff to deal with highly transmissible diseases were maintained. The long interval between this and previous pandemics had led to such facilities being seen as redundant, and they were redeployed to seemingly more relevant purposes. In Melbourne, the immediate response to this outbreak was to quarantine returning travellers in dedicated hotels. These were seen to be sufficiently secure but were found to leak the virus through ventilation systems that were not designed to contain highly infectious diseases. Infections also arose on account of the fallibility of humans charged