



ICOESCO

INTERNATIONAL CONFERENCE
ON ENVIRONMENTAL AND SUSTAINABILITY
CONTEXT

CERTIFICATE OF APPRECIATION

THIS CERTIFICATE IS PRESENT TO

Sri Hartini

as **PRESENTER**

"International Conference on Environmental and Sustainability Context"
Semarang, 24th August 2021

Hosted By

Environmental Sustainability Research Group (EnSi-RG)

and co-hosted by

Environmental Research Center, Lembaga Penelitian Universitas Trisakti, Environmental Engineering Department - Faculty of Engineering - Diponegoro University and Kitakyushu Indonesian Students' Union.

Dr. Ing. Sudarno, S.T., M.Sc

**Representative of Steering
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The Environmental Impact Assessment of Furniture Production Process Using the Life Cycle Assessment

[Hartini S.](#) ; [Wicaksono P.A.](#); [Prastawa H.](#); [Hadyan A.F.](#); [Sriyanto](#)

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Abstract

The aim of this study is to evaluate the environmental impact of the wood table production process using the Life Cycle Assessment. Case studies are carried out in a wood furniture SME in Indonesia. Each activity is modelled using primary data, related to the input and output of the process. The production process includes four phases: sawing process, construction process, assembly process, and finishing process. The system boundary includes all activities that occur within the woodworking plant including

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Circular Economy-based Product Substitution Design Rationale

Hartini, S. , Prastawa, H. , Tjahjono, B. (2022) *Journal of Industrial Engineering and Management*

Upcycle strategy on tree branches to improve eco-efficiency towards a circular economy using life cycle assessment

Hartini, S. , Rumita, R. , Huda, M.H.A. (2022) *IOP Conference Series: Earth and Environmental Science*

Environmental impact assessment of tofu production process: Case study in SME Sugihmanik, Grobogan

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Environmental sustainability assessment of wooden furniture produced in Pakistan | Avaliação da sustentabilidade ambiental de móveis de madeira produzidos no Paquistão

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August 24, 2021



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WELCOMING SPEECH

Keynote Speech - MOU Signing

Head of Environmental Engineering Department, Diponegoro University

24 Aug 2021



First of all, I hope you are keeping safe in this COVID-19 pandemic situation. COVID-19 pandemic has had a considerable impact on us, both in the learning process and our environment. Many challenges and dynamic changes happen, which makes us make some quick adjustments to our life. However, we can go through this pandemic well and open up many opportunities for further collaboration and innovation.

I also want to express my deepest gratitude to the keynote speaker and all of the attendance of ICOESCO 2021.

As you can see in our website and posters, The International Conference on Environmental and Sustainability Context (ICoESCo) is the first international conference hosted by Environmental Sustainability Research Group (EnSi-RG)

and co-hosted by Environmental Research Center, Lembaga Penelitian Universitas Trisakti, Environmental Engineering Diponegoro University, and Kitakyushu Indonesian Students' Union. This conference brings the theme of "Emerging Challenges and Opportunities for Achieving Environmental Sustainability" since the theme of "sustainability" becomes the most crucial issue of the world by now.

At this time, I am feeling excited to see all of the participants who brings optimism through exciting research and findings. Therefore, I believe this conference will give a significant contribution to the achievement of sustainable development goals. I sincerely thank you to all of the conference organizers and the scientific committee. I also want to thank all of the participants and keynote speakers. I hope you can enjoy the discussion and get some insights to improve your research result.

Thank you
Enjoy the discussion.

Semarang, 19th August 2021

Dr. Ing. Sudarno, S.T., M.Sc
Head of Environmental Engineering Department Diponegoro University

WELCOMING SPEECH

Chairman of ICOESCO 2021



On behalf of the 1st ICoESCo 2021 organizing committee, it is a great pleasure for me to welcome you all to the International Conference on Environmental and Sustainability Context. The theme of this conference is “Emerging Challenges and Opportunities for Achieving Environmental Sustainability.” Even in a pandemic situation and done online, this conference is expected to give an interactive forum for sharing and exchanging knowledge on the latest and potential research collaboration in environmental science, engineering, education, and health.

It is an honor for us to welcome all the qualified speakers and participants to this conference. This conference invites 4 keynote speakers from 4 countries, 45 presenters from 4 countries, and 50 participants. The 66 papers which will be presented in this oral session are split into 6 parallel oral sessions. The presenter and participants are coming from different affiliations as researchers, lecturers, practitioners, graduate students. The diversity of the paper submitted at this conference indicates a strong interest in environmental research, which will gain a lot of insight into the development of this country and worldwide.

We would also like to express our heartfelt thank you to the keynote speaker who is willing to share their knowledge at this conference. We wish all the participants to have good attainment. We want to acknowledge our high appreciation to the Head of Department of Environmental Engineering, Diponegoro University, the Head of Lembaga Penelitian Universitas Trisakti, Kitakyushu Indonesian Student’s Union, the keynote speakers, and the steering committee of ICOESCO 2021. We want to thank you for collaborating with and participating universities to support and promote this conference.

I would also like to thank the organizing team for all their hard work and dedication in preparing for this conference. We have tried our best to conduct this conference, but we realize that we may still lack some parts. We want to apologize for any inconvenience.

Semarang, 19th August 2021

Dr. Yustina Metanoia Pusparizkita, S.T., M.T.
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Environmental impact assessment of tofu production process: case study in SME Sugihmanik, Grobogan

S Hartini^{1*}, B S Ramadan², R Purwaningsih¹, S Sumiyati², M A A Kesuma¹

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Abstract. Tofu contains various substances that are very good when consumed to improve people's nutrition. In addition, tofu also has good taste. The problem is that the tofu production process produces products and non-product outputs in the form of waste that is very dangerous if directly disposed of in the environment. The BOD5 content of tofu small and medium-sized enterprises (SMEs) in Sugihmanik Village ranged from 3,667 – 4,933 mg/L and COD 7,668 – 9,736 mg/L. At the same time, the TSS values ranged from 701-1,189 mg/L. The BOD5 value in the river water content is 367 mg/L. It greatly exceeds the set Threshold Value. This study aims to measure the environmental impact using Life Cycle Assessment (LCA). LCA can identify the impact of each activity based on the impact category to identify the processes that contribute significantly to damaging the environment. This study found that the cooking and frying process had the highest impact, where the climate change category was the largest. Wastewater treatment plants, biogas from the biodigester as a substitute for electricity for water pumps, rice husks, and corn cobs are expected to reduce environmental impacts. The first section in your paper

1. Introduction

Tofu is a highly nutritious food from China that is produced from soybean extract [1]. According to the Directorate General of Public Health in 2018, 100 grams of tofu contains 80 kcal of energy, 10.90 grams of protein, 4.70 grams of fat, 0.80 grams of carbohydrates, 223 mg of calcium, 183 mg of phosphorus, 0.1 mg of vitamin B3. and 82.20 grams of water. Tofu is an essential and valuable nutrient because of its relatively large protein content, minerals, vitamins, lipids, and isoflavones [2]. The various substances contained in tofu are excellent when consumed to improve people's nutrition. The public has realized it as seen from the increase in the average consumption of tofu in Indonesia in 2017 by 0.157 kg/capita/week and 2018 to 0.158 kg/capita/week [3]. The increasing consumption of tofu is followed by the emergence of small businesses that produce tofu in Indonesia, so that it has a positive effect on the economic aspect. However, from the environmental aspect, many negative impacts due to the development of tofu SMEs are not followed by proper waste management.

Tofu production produces emissions, liquid and solid waste. Solid waste has been widely used as "*tempe gembus*," animal feed, and processed into crackers, shredded, and dry bread [4]. Meanwhile, solid waste from burning husks and firewood can be used as organic fertilizer [4]. Tofu liquid waste contains BOD (Biochemical Oxygen Demand), COD (Chemical Oxygen Demand), TSS (Total Suspended Solid), and high pH (acidity) [5]. The content of these organic compounds can produce



Advances on Nanotechnology and Applications

M.V. Reddy

Institute of Research Hydro-Québec, Centre of Excellence in Transportation Electrification and Energy Storage (CETEES), Hydro-Québec, **Canada**

redmymvvr@gmail.com

Abstract

In recent years materials for nanotechnology had considerable interest in worldwide researchers due its interesting functional properties and applications in areas of energy, water, health care, and sensors. Research is being carried out worldwide to find alternative novel materials, improved the performance by various materials synthesis processes, surface modification, and fabrication technology.

In my talk, I will discuss various studies on metal oxides, nitrides, fluorides and graphene/metal oxide composite electrode materials related to energy storage and conversion and sensors and other applications. Nanomaterials synthesis, characterization techniques, fundamentals, interface studies and applications related to energy storage and conversion. Various preparation methods (Molten salt, Graphenothermal/carbothermal, coprecipitation, Hydrothermal, Combustion, Ball -milling, solgel and Nitridation, fluorination), Solid electrolytes sintering techniques by powder metallurgy techniques, and thin films fabrication and surface coating techniques. Prepared materials were characterized by Rietveld refinement X-ray diffraction, Neutron diffraction, Rutherford backscattering spectrometry (RBS), Nuclear reaction (NRA), AES, X-ray absorption/photoelectron spectroscopy (XAS/XPS), SEM, TEM, Raman/IR, density and BET surface area methods. Electrode fabrication and various electroanalytical studies like cyclic voltammetry, galvanostatic cycling, and electrochemical impedance spectroscopy, GITT, PITT techniques for Li,Na,K -ion batteries, and in situ and exsitu studies, reaction mechanisms, and voltage hysteresis and present challenges will be discussed. Finally, I will discuss briefly materials recovery techniques and few other interests related to Supercapacitors, Organic cathodes, Solar cells, metal-air batteries, Electrocatalysis, photocatalysis, health care and Magnetic materials and future directions.

Environmental Hazards and Disaster Diplomacy in Critical Geographies

Kamran Azam

Human Resource Development and Disaster Management, Department of Management
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Abstract

In the last seven decades, the tragedies and devastations of natural and manmade hazards have been observed with an accelerated pace in both Afghanistan and Pakistan. Coupled with the natural hazards, a number of conflicts and disputes had emerged across the Durand line. The region has been home to a history of destabilization and wars for the last four decades. The diplomatic interventions for sustained geo-political stability are in hot waters, due to strategic interests of the world powers in the region. Besides, the trust deficit and mutual uncertainty are further deteriorating the situation. There had been numerous attempts to initiate a dialogue on equitable utilization of water resources in the Kabul river basin, but without fruitful outcomes. Both the countries, are facing disaster transformation on a larger scale along-with non-prioritization of their research and diplomacy. The affected communities situated on both the sides are developing dependencies instead of resilience. The vulnerabilities of the marginalized people are increasing and so is a consistent fall in individual coping capacities. Ironically, the region is overwhelmed with post-disaster measures compared to minute focus on pre-disaster. The resource allocation thus not even in a single digit percentage, for preparedness, mitigation, coping related research and risk reduction. This is insufficient for developing social activism and resource mobilization through research activities and diplomacy. However, the intelligentsia in general while diplomats, researchers and academics in particular, ought to be potentially concerned, for bridging these gaps. A theoretical framework is needed for providing a win-win situation for the concerned stakeholders, in order to make sustainable solutions for the miseries of the local communities.

Investigating the effect of PET plastic bottle strips on the strength and compressibility properties of clayey soil

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Abstract. The production of plastic bottles by the manufacturing industry has increased drastically over the last six decades across the globe. This rapid production has led to the generation of many waste plastic bottles, thus causing environmental pollution. About 180 tonnes of plastics are generated daily in Kampala, the capital city of Uganda, and around 50% is dumped into the Kiteezi landfill. Instead of putting pressure on the landfill, these plastic bottle wastes could be reused in stabilizing soils with poor engineering properties. The current study investigates the engineering properties of clayey soil reinforced with Polyethylene-terephthalate waste plastic bottle strips. In order to achieve the objectives of the study, the geotechnical and engineering properties of the soil reinforced with waste plastic bottle strips at 0.1, 0.2, 0.3 and 0.4% of the dry unit weight of the soil and non-stabilized soil were determined by conducting laboratory tests, such as particle size distribution, Atterberg limits, compaction test and California Bearing Ratio. The results revealed that the California Bearing Ratio of the soil reinforced with Polyethylene-terephthalate waste plastic bottle strips increased with the increase in the percentage of Polyethylene-terephthalate waste plastic bottle strips up to 0.3%. Beyond 0.3%, a drop in California Bearing Ratio was observed. It indicates that 0.3% Polyethylene-terephthalate waste plastic bottle strips is the optimum percentage for stabilizing low plasticity clayey soils.

1. Introduction

Plastic waste management is becoming a significant challenge in developing countries like Uganda. Data from various sources reveal that out of 180 tons of plastics that are generated [1,2], 40-50% are transported and dumped to the Kiteezi landfill that is located in Kampala, Uganda [3]. It means that the rest of the waste plastic bottles are disposed in a manner that is not safe. Even those dumped on landfills increase pressure or are poorly managed, as shown in Figure 1 [1]. It is noted that since the population is increasing, the number of wastes generated will also keep on increasing. It calls for looking for alternative ways of utilizing plastic wastes in other sustainable ways. Among the ways of reusing waste plastics could be stabilizing soil. Different solid waste materials, like waste tyres, industrial wastes, incinerator ash, and others, have been used to stabilize soils with poor engineering properties, showing positive results [4–6]. The basic idea about soil stabilization is about improving or altering the index properties, improving the gradation, and improving the soil's strength properties to be suitable for

