

LEMBAR
HASIL PENILAIAN SEJAWAT SEBIDANG ATAU PEER REVIEW
KARYA ILMIAH : PROSIDING

Judul Karya Ilmiah : The Influence of Keruing Sawdust on The Geotechnical Properties of Expansive Soils
 Jumlah Penulis : 3 Orang (J B Niyomukiza, **S P R Wardani**, BH Setiadji)
 Status Pengusul : Penulis Ke-2
 Identitas Prosiding : a. Judul Prosiding : IOP Conference Series: Earth and Environmental Science, Volume 448, 012040
 The 1st International Conference on Environment, Sustainability Issues and Community Development (INCRID 2019)
 b. ISBN/ISSN : 1755-1315 (Online), 1755-1307 (Print)
 c. Thn Terbit, Tempat Pelaks. : 2020, Semarang, 23 - 24 October 2019
 d. Penerbit/Organiser : (Institute of Physics) IOP Publishing Ltd
 e. Alamat Repository/Web : <https://iopscience.iop.org/article/10.1088/1755-1315/448/1/012040>
 Alamat Artikel : <https://iopscience.iop.org/article/10.1088/1755-1315/448/1/012040/pdf>
 f. Terindeks di (jika ada) : Scopus

Kategori Publikasi Makalah : ☒ *Prosiding Forum Ilmiah Internasional*
 (beri ✓ pada kategori yang tepat) ☐ *Prosiding Forum Ilmiah Nasional*

Hasil Penilaian *Peer Review* :

Komponen Yang Dinilai	Nilai Reviewer		Nilai Rata-rata /Nilai Akhir yang diperoleh
	Reviewer I	Reviewer II	
a. Kelengkapan unsur isi prosiding (10%)	2,75	3,00	2,87
b. Ruang lingkup dan kedalaman pembahasan (30%)	8,00	7,00	7,50
c. Kecukupan dan kemutakhiran data/informasi dan metodologi (30%)	8,25	8,00	8,13
d. Kelengkapan unsur dan kualitas penerbit (30%)	8,75	8,00	8,37
Total = (100%)	27,75	26,00	26,87
Nilai Pengusul = 40%/2 x 26,87 = 5,37			

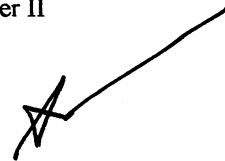
Reviewer I



Prof. Dr. Ir. Suripin, M.Eng.
 NIP. 196004271987031001
 Unit kerja : Dept. Teknik Sipil FT UNDIP

Semarang,

Reviewer II



Prof. Ir. M. Agung Wibowo, MM, M.Sc, Ph.D
 NIP. 196702081994031005
 Unit Kerja: Dept. Teknik Sipil FT UNDIP

LEMBAR
HASIL PENILAIAN SEJAWAT SEBIDANG ATAU PEER REVIEW
KARYA ILMIAH : PROSIDING

Judul Karya Ilmiah : The Influence of Keruing Sawdust on The Geotechnical Properties of Expansive Soils
 Jumlah Penulis : 3 Orang (J B Niyomukiza, **S P R Wardani**, BH Setiadji)
 Status Pengusul : Penulis Ke-2
 Identitas Prosiding : a. Judul Prosiding : IOP Conference Series: Earth and Environmental Science, Volume 448, 012040
 The 1st International Conference on Environment, Sustainability Issues and Community Development (INCRID 2019)
 b. ISBN/ISSN : 1755-1315 (Online), 1755-1307 (Print)
 c. Thn Terbit, Tempat Pelaks. : 2020, Semarang, 23 - 24 October 2019
 d. Penerbit/Organiser : (Institute of Physics) IOP Publishing Ltd
 e. Alamat Repository/Web : <https://iopscience.iop.org/article/10.1088/1755-1315/448/1/012040>
 Alamat Artikel : <https://iopscience.iop.org/article/10.1088/1755-1315/448/1/012040/pdf>
 f. Terindeks di (jika ada) : Scopus

Kategori Publikasi Makalah : ☒ Prosiding Forum Ilmiah Internasional
 (beri ✓ pada kategori yang tepat) ☐ Prosiding Forum Ilmiah Nasional

Hasil Penilaian *Peer Review* :

Komponen Yang Dinilai	Nilai Maksimal Prosiding		Nilai Akhir Yang Diperoleh
	Internasional ☒ 30	Nasional ☐	
a. Kelengkapan unsur isi prosiding (10%)	3,00		2,75
b. Ruang lingkup dan kedalaman pembahasan (30%)	9,00		8,00
c. Kecukupan dan kemutakhiran data/informasi dan metodologi (30%)	9,00		8,25
d. Kelengkapan unsur dan kualitas terbitan /prosiding (30%)	9,00		8,75
Total = (100%)	30,00		27,75
Nilai Pengusul = (40% x 27,75)/2 = 5,55			

Catatan Penilaian artikel oleh Reviewer :

1. Kesesuaian dan kelengkapan unsur isi prosiding:

Isi artikel termasuk dalam tema Seminar/Prosiding, kelengkapan unsur prosiding cukup lengkap, susunan key sprakers, steering committees, dan scientific committees lengkap.

2. Ruang lingkup dan kedalaman pembahasan:

Ruang lingkup pembahasan cukup mendalam, pembahasan memanfaatkan pada referensi yang digunakan, ada kurang lebih 4 dari 26 referensi yang disitasi dalam pembahasan.

3. Kecukupan dan kemutakhiran data/informasi dan metodologi:

Referensi yang digunakan cukup banyak, ada 26 buah, 11 buah diantaranya berupa jurnal mutakhir, terbitan 10 tahun terakhir, lainnya berupa standar. Metodologi dijabarkan dan cukup jelas dan sesuai dengan tujuan yang dirumuskan.

4. Kelengkapan unsur dan kualitas terbitan:

Kelengkapan unsur dan kualitas terbitan cukup baik, tulisan merupakan satu kesatuan yang utuh.

Semarang, 02 Juli 2020

Reviewer 1

Prof. Dr. Ir. Suripin, M.Eng.

NIP. 196004271987031001

Unit kerja: Departemen Teknik Sipil FT UNDIP

LEMBAR
HASIL PENILAIAN SEJAWAT SEBIDANG ATAU PEER REVIEW
KARYA ILMIAH : PROSIDING

Judul Karya Ilmiah : The Influence of Keruing Sawdust on The Geotechnical Properties of Expansive Soils
 Jumlah Penulis : 3 Orang (J B Niyomukiza, S P R Wardani, BH Setiadji)
 Status Pengusul : Penulis Ke-2
 Identitas Prosiding : a. Judul Prosiding : IOP Conference Series: Earth and Environmental Science, Volume 448, 012040
 The 1st International Conference on Environment, Sustainability Issues and Community Development (INCRID 2019)
 b. ISBN/ISSN : 1755-1315 (Online), 1755-1307 (Print)
 c. Thn Terbit, Tempat Pelaks. : 2020, Semarang, 23 - 24 October 2019
 d. Penerbit/Organiser : (Institute of Physics) IOP Publishing Ltd
 e. Alamat Repository/Web : <https://iopscience.iop.org/article/10.1088/1755-1315/448/1/012040>
 Alamat Artikel : <https://iopscience.iop.org/article/10.1088/1755-1315/448/1/012040/pdf>
 f. Terindeks di (jika ada) : Scopus

Kategori Publikasi Makalah : ☒ Prosiding Forum Ilmiah Internasional
 (beri ✓ pada kategori yang tepat) ☐ Prosiding Forum Ilmiah Nasional

Hasil Penilaian Peer Review :

Komponen Yang Dinilai	Nilai Maksimal Prosiding		Nilai Akhir Yang Diperoleh
	Internasional ☒	Nasional ☐	
a. Kelengkapan unsur isi prosiding (10%)	3,00		3
b. Ruang lingkup dan kedalaman pembahasan (30%)	9,00		7
c. Kecukupan dan kemutakhiran data/informasi dan metodologi (30%)	9,00		8
d. Kelengkapan unsur dan kualitas terbitan /prosiding (30%)	9,00		8
Total = (100%)	30,00		26
Nilai Pengusul = $(40\% \times 26) / 2 = 5,2$			

Catatan Penilaian artikel oleh Reviewer :

- Kesesuaian dan kelengkapan unsur isi prosiding:
 Paper memilih → Abstract, Introduction, Material and Methods, Result and Discussion, Conclusions and References.
 Tujuan dpt dijabarkan pd. Result and Discussion, serta dijawab pd. Conclusion.
- Ruang lingkup dan kedalaman pembahasan:
 Result and Discussion → membahas Properties of natural soil, Atterberg Compaction Characteristics, Unconfined compressive strength, Limits, California Bearing Ratio, Paper dan journal to dlmw. dipakai sebagai Referensi.
- Kecukupan dan kemutakhiran data/informasi dan metodologi:
 Metodologi → dijabarkan pada Materials and Methods, meliputi: Materials, Methods → meliputi Grain Size Distribution, Atterberg Limit test, Compaction test, UCS dan CBR. Data berdasarkan test Laboratorium.
- Kelengkapan unsur dan kualitas terbitan:
 Paper memilih → Abstract, Introduction, Material and Methods, Result and Discussion, Conclusion and References.
 Paper di tbitkan pada Prosiding Ilmiah Internasional → IOP Conference Series: Earth and Environmental Science, Vol. 448.

Semarang,
 Reviewer 2

Prof. Ir. M. Agung Wibowo, MM, M.Sc, Ph.D
 NIP. 196702081994031005
 Unit Kerja : Departemen Teknik Sipil FT UNDIP

Document details

< Back to results | 1 of 1

 Export  Download  Print  E-mail  Save to PDF  Save to list More... >

View at Publisher

IOP Conference Series: Earth and Environmental Science
Volume 448, Issue 1, 3 April 2020, Article number 012040
1st International Conference on Environment, Sustainability Issues and Community Development,
INCRID 2019; Santika Premiere Hotel Semarang, Central Java Province; Indonesia; 23 October
2019 through 24 October 2019; Code 159006

The influence of Keruing Sawdust on the geotechnical properties of expansive Soils (Conference Paper) [\(Open Access\)](#)

Niyomukiza, J.B.  Wardani, S.P.R., Setiadji, B.H.

 Save all to author list

Civil Engineering Department, Diponegoro University, Semarang, Central Java, Indonesia

Abstract

↕ View references (26)

Expansive soils have proved to be problematic to most Civil Engineering structures. Several researchers have tried to look for different materials which can alter the properties of these poor soils, and among them are lime and cement, which are expensive. Considering the vast quantities of sawdust produced in woodwork departments, they can be used as a secondary stabilizer, thus leading to sustainable technologies. Sawdust not only acts as a cheap stabilizer but also reduces the problem of environmental pollution caused by its poor disposal. This paper examines the geotechnical properties of expansive soil stabilised by Keruing sawdust. The sawdust used as partial replacement of soil in the ratio of 0, 3, 5, and 7% by the dry soil weight. The investigation was done by conducting laboratory tests on both stabilised and non-stabilized soils. The results showed that Keruing sawdust significantly improved the geotechnical properties of the soil by reducing the plasticity index from 64% to 36% at 0% and 7% sawdust, respectively. The unconfined compressive strength and California Bearing Ratio also improved at 3% sawdust + 97% soil. It concluded that Keruing sawdust, a waste material could be used as a cheap additive to the expansive grounds. © 2020 IOP Publishing Ltd.

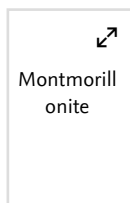
SciVal Topic Prominence ⓘ

Topic: Expansive Soil | Dry Density | Lime

Prominence percentile: 96.627 ⓘ

Chemistry database information ⓘ

Substances



Indexed keywords

Engineering controlled terms: [Compressive strength](#) [Lime](#) [Soils](#) [Stabilization](#) [Sustainable development](#)

Metrics ⓘ [View all metrics >](#)



PlumX Metrics

Usage, Captures, Mentions,
Social Media and Citations
beyond Scopus.



Cited by 0 documents

Inform me when this document is
cited in Scopus:

[Set citation alert >](#)

[Set citation feed >](#)

Related documents

Resilient Response and Permanent Strain of Subgrade Soil Stabilized with Byproduct Recycled Steel and Cementitious Materials

RababAh, S., Al Hattamleh, O., Aldeeky, H.
(2020) *Journal of Materials in Civil Engineering*

In situ solidification of an industrial sludge lagoon: Laboratory studies and field activities

Legiec, I.A., Jensen, R.H., Little, N.K.
(1996) *Journal of Environmental Science and Health - Part A Toxic/Hazardous Substances and Environmental Engineering*

Importance of Soil Pulverization Level in Lime Stabilized Soil Performance

Bozbey, I., Demir, B., Komut, M.
(2016) *Procedia Engineering*

[View all related documents based on references](#)

Find more related documents in Scopus based on:

[Authors >](#) [Keywords >](#)

ISSN: 17551307
Source Type: Conference Proceeding
Original language: English

DOI: 10.1088/1755-1315/448/1/012040
Document Type: Conference Paper
Publisher: Institute of Physics Publishing

References (26)

View in search results format >

☐ All

Export

Print

E-mail

Save to PDF

Create bibliography

☐ 1

Hussain, S.
Effect of Compaction Energy on Engineering Properties of Expansive Soil
(2017) *Civ Eng J.*, 3 (8), pp. 610-616. Cited 4 times.

☐ 2

Papagiannakis, A.T., Masad, E.A.
(2008) *Pavement Design and Materials*. Cited 66 times.

☐ 3

Al-Soudany, K., Al-Gharbawi, A., Al-Noori, M.
Improvement of clayey soil characteristics by using activated carbon
(2008) *MATEC Web Conf*, pp. 1-9.
01009

☐ 4

Sun, S., Liu, B., Wang, T.
Improvement of expansive soil properties using sawdust

(2018) *Journal of Solid Waste Technology and Management*, 44 (1), pp. 78-85.
<http://docserver.ingentaconnect.com/deliver/connect/jswt/10881697/v44n1/s9.pdf?expires=1525373110&id=0000&titleid=72010561&checksum=0769504967A169FC8A49AAC92CEFD9D9>
doi: 10.5276/JSWTM.2018.78

View at Publisher

☐ 5

Nelson, J.D., Chao, K.C., Overton, D.D., Nelson, E.J.
Foundation Engineering for Expansive Soils

(2015) *Foundation Engineering for Expansive Soils*, pp. 1-385. Cited 60 times.
<http://onlinelibrary.wiley.com/book/10.1002/9781118996096>
ISBN: 978-111899609-6; 978-047058152-0
doi: 10.1002/9781118996096

View at Publisher

☐ 6

Zumrawi, M.M.E.
Stabilization of Pavement Subgrade by Using Fly Ash Activated by Cement
(2015) *Am. J. Civ. Eng. Archit.*, 3, pp. 218-224. Cited 12 times.

☐ 7

Hussein, E.A.
Viscoplastic Finite Element Model for Expansive Soils
(2001) *Electron. J. Geotech. Eng.*, 4, pp. 2001-2012.

- 8 Ardah, A., Chen, Q., Abu-Farsakh, M.
Evaluating the performance of very weak subgrade soils treated/stabilized with cementitious materials for sustainable pavements
(2017) *Transportation Geotechnics*, 11, pp. 107-119. Cited 15 times.
<http://www.journals.elsevier.com/transportation-geotechnics/>
doi: 10.1016/j.trgeo.2017.05.002
[View at Publisher](#)
-
- 9 Dhakal, S.
Stabilization of very weak subgrade soil with cementitious stabilizers
(2012) *Master Sci. Thesis*. Cited 4 times.
-
- 10 Jasim, O.H.
Effect of Sawdust Usage on the Shear Strength Behavior of Clayey Silt Soil
(2016) *Sigma J. Eng.*, 34, pp. 31-34. Cited 5 times.
-
- 11 Ogunribido, T.H.T.
Geotechnical Properties of Saw Dust Ash Stabilized Southwestern Nigeria Lateritic Soils
(2012) *Environ. Res. Eng. Manag.*, 2, pp. 29-33. Cited 9 times.
-
- 12 Jjuuko, S., Kalumba, D., Bagampadde, U.
The use of locally available sand in stabilization of Ugandan clayey soils Case study of clayey soil from Busega area in Uganda
(2011) *Institution of Professional Engineers 16th National Technology Conference (NTC 2011)*
-
- 13 Kumar Yadav, A., Gaurav, K., Kishor, R., Suman, S.K.
Stabilization of alluvial soil for subgrade using rice husk ash, sugarcane bagasse ash and cow dung ash for rural roads ([Open Access](#))
(2017) *International Journal of Pavement Research and Technology*, 10 (3), pp. 254-261. Cited 24 times.
<https://www.journals.elsevier.com/international-journal-of-pavement-research-and-technology/>
doi: 10.1016/j.ijprt.2017.02.001
[View at Publisher](#)
-
- 14 Osinubi, K.J., Edeh, J.E., Onoja, W.O.
Sawdust ash stabilization of reclaimed asphalt pavement
(2012) *ASTM Special Technical Publication*, 1540 STP, pp. 454-467. Cited 5 times.
ISBN: 978-080317526-6
doi: 10.1520/JAI103751
[View at Publisher](#)
-
- 15 Koteswara, R.D., Anusha, M., Pranav, P.R.T., Venkatesh, G.
A Laboratory Study on the Stabilization of Marine Clay Using Saw Dust and Lime
(2012) *Int. J. Eng. Sci. Adv. Technol.*, 2, pp. 851-862. Cited 6 times.
-
- 16 Horisawa, S.
Biodegradation of nonlignocellulosic substances II: Physical and chemical properties of sawdust before and after use as artificial soil
(1999) *Journal of Wood Science*, 45 (6), pp. 492-497. Cited 18 times.
<http://www.springerlink.com/content/1435-0211>
doi: 10.1007/BF00538959
[View at Publisher](#)

17

(2002) *Standard Test Method for Particle Size Analysis of Soils*. Cited 1468 times.
ASTM International

18

(2009) *Standard Test Methods for Particle-size Distribution (Gradation) of Soils Using Sieve Analysis*, pp. D6904-D6913. Cited 278 times.
ASTM International

19

(2017) *Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils*, pp. D4318-17e1. Cited 1133 times.
ASTM International

20

Chen, F.H.
(1975) *Foundations on Expansive Soils*, 12.

21

(2012) *Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft³ (600 kN-m/m³))*, pp. D698-12e2. Cited 939 times.
ASTM International

22

(2016) *Standard Test Method for Unconfined Compressive Strength of Cohesive Soil*. Cited 670 times.
ASTM International

23

Das, M.B.
(2008) *Advanced Soil Mechanics Third Edit*. Cited 560 times.

24

Das, M.B.
(2002) *Soil Mechanics Laboratory Manual Sixth Edit*

25

(2014) *Standard Test Method for California Bearing Ratio (CBR) of Laboratory-compacted Soils*, pp. D1814-D1883. Cited 265 times.
ASTM International

26

(2004) *Guide for Mechanistic-Empirical Design of New and Rehabilitated Pavement Structures*. Cited 1107 times.
NCHRP

ELSEVIER

[Terms and conditions ↗](#) [Privacy policy ↗](#)

Copyright © Elsevier B.V. All rights reserved. Scopus® is a registered trademark of Elsevier B.V.

We use cookies to help provide and enhance our service and tailor content. By continuing, you agree to the use of cookies.

 RELX

Source details

IOP Conference Series: Earth and Environmental Science

Scopus coverage years: from 2010 to Present

ISSN: 1755-1307 E-ISSN: 1755-1315

Subject area: [Environmental Science: General Environmental Science](#) [Earth and Planetary Sciences: General Earth and Planetary Sciences](#)

[View all documents >](#) [Set document alert](#) [📁 Save to source list](#) [Journal Homepage](#)

CiteScore 2019
0.4 ⓘ
[Add CiteScore to your site](#)

SJR 2019
0.175 ⓘ

SNIP 2019
0.514 ⓘ

[CiteScore](#) [CiteScore rank & trend](#) [Scopus content coverage](#)

i

Improved CiteScore methodology

CiteScore 2019 counts the citations received in 2016-2019 to articles, reviews, conference papers, book chapters and data papers published in 2016-2019, and divides this by the number of publications published in 2016-2019. [Learn more >](#)

×

CiteScore

2019

▼

0.4

=

11,544 Citations 2016 - 2019

32,872 Documents 2016 - 2019

Calculated on 06 May, 2020

CiteScoreTracker 2020

ⓘ

0.4

=

14,194 Citations to date

38,508 Documents to date

Last updated on 10 June, 2020 • Updated monthly

CiteScore rank 2019 ⓘ

Category	Rank	Percentile
Environmental Science		
General Environmental Science	#176/210	16th
Earth and Planetary Sciences		
General Earth and Planetary Sciences	#164/187	12th

[View CiteScore methodology >](#) [CiteScore FAQ >](#) [🔗](#)

About Scopus

- [What is Scopus](#)
- [Content coverage](#)
- [Scopus blog](#)
- [Scopus API](#)
- [Privacy matters](#)

Language

- [日本語に切り替える](#)
- [切换到简体中文](#)
- [切换到繁體中文](#)
- [Русский язык](#)

Customer Service

- [Help](#)
- [Contact us](#)

CERTIFICATE OF APPRECIATION

The 1st International Conference on
Environment, Sustainability Issues,
and Community Development (INCRID)



THIS IS TO CERTIFY THAT

Niyomukiza John Bosco

HAS PARTICIPATED AS
PRESENTER

"Discovering Innovations and Opportunities for Sustainable Living Environment"

October 23rd - 24th, 2019



Dean

Prof. Ir. M. Agung Wibowo, M.M., M.Sc., PhD

NIP. 196702081994031005

Chair of Organizing Committee

M. Arief Budihardjo, S.T., M.Eng.Sc., PhD

NIP. 197409302001121002



INCRID 2019

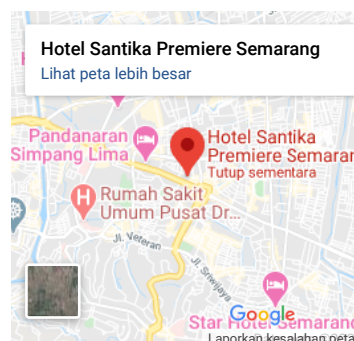
The 1st International Conference on Environment, Sustainability Issues and Community Development

“Discovering Innovations and Opportunities for Sustainable Living Environment”



Venue

23rd-24th October 2019
Santika Premiere Hotel,
Semarang–Indonesia



Topic Areas

A. Environment, Health, & Safety

- Environment, health, and safety system
- Environmental modelling and computation

B. Environmental Technology

- Waste management and treatment
- Water and wastewater engineering

C. Green Infrastructure

- Life cycle assessment
- Green building and technology option

D. Energy Conservation and Efficiency

- Clean and renewable energy
- Climate change and global warming

E. Urban Development & Resilient Community

- Urban development and management
- Community development and empowerment

F. Sustainable Development

- Sustainable economy, policy, and education
- Innovation in sustainable development goals (SDGs)



experiences and explore the possible influence of sustainable living environment in the future.

Commitees

> Steering Committee

✓ Scientific Committee

1. Prof. Lam Khee Poh, (National University Singapore, Singapore)
2. Prof. Toru Matsumoto, (Kitakyushu University, Japan)
3. Prof. Mohd. Hamdan Ahmad, (Universiti Teknologi Malaysia, Malaysia)
4. Prof. Yee-Lin Wu, (National Cheng Kung University, Taiwan)
5. Prof. Hamid Nikraz (Curtin University, Australia)
6. Prof. Eddy Saputra (Universitas Riau, Indonesia)
7. Dr. Ing. Sudarno, S.T., M.Si. (Universitas Diponegoro, Indonesia)
8. Dr. Budi Prasetyo Samadikun, S.T., M.Si. (Universitas Diponegoro, Indonesia)
9. Dr. Ir. Anik Sarminingsih, M.T. (Universitas Diponegoro, Indonesia)
10. Pertiwi Andarani, S.T., M.T., M.Eng. (Universitas Diponegoro, Indonesia)

> Organizing Committee



Prof. Lam Khee Poh



Prof. Mohd. Hamdan Ahmad



Dr. Sudarmanto Budi Nugroho



Mario Rosario Guarracino, Ph.D.



M. Agung Wibowo, Ph.D.

Keynote Speaker

1. Prof Lam Khee Poh
Green buildings & life-cycle modelling
(National University Singapore, Singapore)
2. Prof. Mohd. Hamdan Ahmad
Sustainable cities & urban habitat
(Universiti Teknologi Malaysia, Malaysia)
3. Dr. Sudarmanto Budi Nugroho
Urban Air Quality
(Institute for Global Environmental Strategies, Japan)
4. Mario Rosario Guarracino, Ph.D.
Bioinformatics & mathematical programming
(National Research Council of Italy, Italy)
5. M. Agung Wibowo, Ph.D..
Lean Construction
(Diponegoro University, Indonesia)

Hosted By



Department of Environmental Engineering

This site uses cookies. By continuing to use this site you agree to our use of cookies. To find out more, see our Privacy and Cookies policy.



☐ **NOTICE:** Ensuring subscriber access to content on IOPscience throughout the coronavirus outbreak - see our remote access guidelines.

Table of contents

Volume 448

2020

◀ Previous issue Next issue ▶

The 1st International Conference on Environment, Sustainability Issues and Community Development 23 - 24 October 2019, Central Java Province, Indonesia

Accepted papers received: 29 January 2020

Published online: 03 April 2020

Open all abstracts

Preface

OPEN ACCESS 011001

Preface

+ Open abstract View article PDF

OPEN ACCESS 011002

Peer review statement

+ Open abstract View article PDF

Energy Conservation and Efficiency

OPEN ACCESS 012001

Techno-Economic Analysis Small Biodiesel Plant from Palm Sludge Oil

A Wicaksono, Widayat and S Saptadi

+ Open abstract View article PDF

OPEN ACCESS 012002

Comparison of Biogas Productivity in Thermophilic and Mesophilic Anaerobic Digestion of Bioethanol Liquid Waste

N A Wardani, N Afiqah, M M Azis and W Budhiyanto

+ Open abstract View article PDF

OPEN ACCESS 012003

Analysis of Electricity Generation from Landfill Gas (Case Study: Manggar Landfill, Balikpapan)

C K Banaget, B Frick and M N I L Saud

+ Open abstract View article PDF

OPEN ACCESS 012004

CFD Simulation on the Natural Ventilation and Building Thermal Performance

R Widiastuti, M I Hasan, C N Bramiana and P U Pramesti

+ Open abstract View article PDF

OPEN ACCESS 012005

Lighting System Energy Conservation Simulation at Faculty of Engineering Diponegoro University Library Using Ecotect

R W Wijayanti, E Prianto and J Windarta

+ Open abstract View article PDF

OPEN ACCESS 012006

Taperless Type Blade Design with Naca 5513 Airfoil for Wind Turbine 500 TSD

E Yohana, N Sinaga, I Haryanto, V R I Taufik and E Dharmawan

+ Open abstract View article PDF

OPEN ACCESS 012007

The Effectiveness of Biogas Method from Rice Husks Waste: Liquid Anaerobic Digestion and Solid-State Anaerobic Digestion

OPEN ACCESS	012030
Greenhouse Gas Estimation of Plastic Waste Reverse Logistic Networks System in Semarang City	
B P Samadikun, B S Ramadan, A Rezagama, P Andarani and C T Dewi	
+ Open abstract View article PDF	
Environmental Technology	
OPEN ACCESS	012031
Banana Tree as Natural Biofilter for Organic Contaminant in Wastewater Treatment	
B Zaman, E Sutrisno, F P Cahyani and D M Raharyani	
+ Open abstract View article PDF	
OPEN ACCESS	012032
Natural Soil as Bio-activator for Wastewater Treatment System	
B Zaman, E Sutrisno, S Sudarno, M N Simanjutak and E Krisnanda	
+ Open abstract View article PDF	
OPEN ACCESS	012033
Is Bio-activator from Vegetables Waste are Applicable in Composting System?	
E Sutrisno, B Zaman, I W Wardhana, L Simbolon and R Emeline	
+ Open abstract View article PDF	
OPEN ACCESS	012034
Quality Control of HDPE Bottles Production Processes based on Multivariate Attribute Data using T ² Hotelling Control Chart as A Responds of Environment and Sustainability Issues	
B Arfan, P Darminto and W S Indah	
+ Open abstract View article PDF	
OPEN ACCESS	012035
Ambient Carbon Dioxide in Industrial and Commercial Area Measured by Unmanned Aerial Vehicle (UAV)	
H S Huboyo, O R Manullang, B P Samadikun, D I Ningrum, N Fahira and Y Prayudi	
+ Open abstract View article PDF	
OPEN ACCESS	012036
Analysis of Motives that Affects Registrant and Patent Owners in Indonesia	
A Bakhtiar, D I Rinawati, D Pujotomo, I Indra and P R Handayani	
+ Open abstract View article PDF	
OPEN ACCESS	012037
Batik Pemalang Organic Wastewater Composition and Simple Electrocoagulation-Filtration Treatment	
N I Pratiwi, S R Sari, F Arifan, A T Wulandari, I Alkian, B Mustasjar and M B F B Aji	
+ Open abstract View article PDF	
OPEN ACCESS	012038
Potential of Water Pollution in Girimulyo, West Progo	
R A T Listyani and S N Peni	
+ Open abstract View article PDF	
OPEN ACCESS	012039
Crackers from Fresh Water Snail (<i>Pila ampullacea</i>) Waste as Alternative Nutritious Food	
R T D W Broto, F Arifan, W A Setyati, K Eldiarosa and A R Zein	
+ Open abstract View article PDF	
OPEN ACCESS	012040
The influence of Keruing Sawdust on the geotechnical properties of expansive Soils	
J B Niyomukiza, S P R Wardani and B H Setiadji	
+ Open abstract View article PDF	
OPEN ACCESS	012041
Decreasing Iron (Fe) Contaminant from Ground Water for Water Treatment Processed by Dielectric Barrier Discharge Ozone Generator	
R A Putri, W Oktiawan and A Syakur	
+ Open abstract View article PDF	

CFD Simulation on the Natural Ventilation and Building Thermal Performance

R Widiastuti^{1,3}, M I Hasan^{2,3}, C N Bramiana^{2,3}, P U Pramesti³

¹Faculty of Integrated Technologies, Jalan Tungku Link, Gadong, BE1410, **Brunei Darussalam**

²Department of Architecture, Faculty of Built Environment, University of Malaya, 50603, Kuala Lumpur-**Malaysia**

³Architectural Design, Vocational School, Diponegoro University, Jalan Prof. H. Soedarto S.H, Tembalang-Semarang, 50275, Indonesia

ratihw@arsitektur.undip.ac.id

Abstract. The types of window, either permanent or impermanent will influence the building thermal profiles. Natural ventilation is one of technique to create passive cooling design in the building. It can improve the quality of indoor air, thermal comfort and reduction of energy consumption for air conditioning. In this present work, a study on the type of natural ventilation and the effect to thermal building performance was conducted. There are two types of natural ventilation as main variable in this study, top hung window and jalousie window. To develop the study, a simulation used Computational Fluid Dynamics (CFD) also conducted. One natural ventilation as outlet also added in the simulation. Based on the data measurement and computer simulation, jalousie window can provide better thermal performance. The range of difference between indoor air temperature on the chamber with jalousie window and chamber with top hung window is 0.2°C to 0.5°C, showing greater heat loss. The average of amount on the indoor air flow also was found 0.0317 m/s higher in the chamber with jalousie window. Particularly in the inlet, it was clear that the velocity of incoming air flow is faster and significantly allowed greater air with lower temperature entered from outside to inside.

1. Introduction

Natural ventilation is ventilation technique without any mechanical devices [1]. It is one of strategies to improve building thermal performance by resulting air temperature changes that entering building [2]. It also reduces the amount energy consumption for air conditioning and improving indoor air quality [3-6]. Building with natural ventilation has 40% lower for energy consumption [7,8]. Especially for traditional residential building, natural ventilation can increase the exchange of indoor and outdoor air, provides internal air renewal and thermal comfort for the occupant [9]. Sick building syndrome (SBS) is easy to come when building does not have enough ventilation [10-13]. Therefore, strategies of natural ventilation should be integrated into building design.

The existence of external wind velocities, wind direction and vegetation around building become the external factors that influence the performance of natural ventilation [14]. Elshafei et al. [15] also said that temperature, air velocity and humidity have strong influence on the natural ventilation. While



Analysis of Electricity Generation from Landfill Gas (Case Study: Manggar Landfill, Balikpapan)

C K Banaget¹, B Frick² and M N I L Saud¹

¹Environmental Engineering Study Program, Institut Teknologi Kalimantan, Balikpapan 76127, Indonesia

²Energy Engineering Department, Polytech Annecy-Chambery, Universite Savoie Mont Blanc, Annecy 74940, France

keumala@lecturer.itk.ac.id

Abstract. Despite of adverse impacts on the environment, landfill has big potency as renewable energy sources since it generates biogas from organic waste degradation process which can be used for power plant purposes. In 2017, the volume of waste disposed to Manggar Landfill was 128,000 tons, which mostly are organic waste (59.4%). Therefore, this study aims to estimate the amount of energy that can be generated from landfill as methane, by calculating biogas production in landfill based on waste generation, as well as composition using LandGem and Afvalzorg model. In 2017, Manggar landfill produced about 4×10^3 Mg CH₄/year or about 5.31 to 6.44×10^6 m³/year. The estimated methane then converted to electricity using gas engine and trigeneration methods. Using gas engine, methane from Manggar Landfill is predicted to produce electricity about 787 MWh/month. On the other hand, if trigeneration method applied (by keeping the same gas engine as before), it produces 41.8% of heat which convert to 29.3 kWh of cold. In conclusion, it will be beneficial if Manggar Landfill capture and treat methane for generating electricity since Manggar Landfill produces about 6.44×10^6 m³/year which can be used for electricity purposes of around 10,000 people using gas engine.

1. Introduction

Landfilling is the most preferable method applied in developing countries, particularly in Indonesia, in handling its municipal solid waste. It is considered as cheap and convenient method since it is not restricted to advanced technology for treating and managing waste. Despite of its economics advantages, landfilling gives many adverse impacts on environment. The failure of landfilling methods may lead to many environmental contaminants due to leachate and which are soil pollution, ground water contamination and air pollution due to emission of greenhouse gases [1]. Therefore, waste management hierarchy put landfilling method as last option preferable due to its adverse effect to environment.

In Balikpapan, landfilling has been practiced many years ago, but proper landfilling area named Manggar landfill was opened in 2002. When opened in 2002, the volume of waste disposed to Manggar landfill was 69,000 tons and in 2017 it reached 128,000 tons. In a period of 15 years, the volume of waste has doubled. Urban waste that is directly piled up still contains a lot of organic waste at 59.4%. Followed by plastic waste, paper, and others, which have a composition respectively: 13.51%, 12.26%, and 10.62%. This high percentage of organic waste gives adverse impact from landfill gas produced by



Content from this work may be used under the terms of the [Creative Commons Attribution 3.0 licence](#). Any further distribution of this work must maintain attribution to the author(s) and the title of the work, journal citation and DOI.

Monitoring Results of a 10kwp On-Grid Photovoltaic System in the Context of the Current Regulation for Solar Rooftops in Indonesia

D Pianka^{1,2,3} and E Setyowati^{2,3}

¹ Christliche Fachkräfte International, Stuttgart, [Germany](#)

² Department of Physics, Faculty of Science and Computer, Universitas Kristen Immanuel, Yogyakarta, Indonesia

³ Study center for Renewable Energy, Universitas Kristen Immanuel, Yogyakarta, Indonesia

daniel@ukrimuniversity.ac.id

Abstract. To fulfil the Paris climate agreement, the Indonesian government aims to increase the share of renewable energy. New regulation for solar rooftops came into effect in January 2019 to give more security for investments in solar projects. However, for a majority of consumers, the implementation of the regulation and economical operation of a PV system brings many hurdles. A 10 kWp PV on-grid system at UKRIM University is monitored to gain information about energy data, return of investment (RoI) and levelized costs of energy (LCOE). Based on the monitoring results, three different consumer types (social institutions, residential buildings and offices) are analyzed with respect to profitability. For the PV installation at UKRIM, an RoI of 17 years is calculated. The LCOE is calculated as 0.08 USD/kWh and thus higher than the levelized feed-in price of only 0.076 USD/kWh. The current ten kWp PV system can offset 80% of the electricity demand of the building it is connected to. Nevertheless, the most economical size would be only seven kWp, showing that the most green (zero net energy) and the most economical system (fastest RoI) can differ greatly. The slow RoI makes a PV on-grid system economically not interesting for social tariffs. Though residential buildings and office buildings can achieve faster RoI, mainly because of higher electricity prices.

1. Introduction

In the Paris Agreement 2016, Indonesia, among 195 other countries, determined contributions to mitigate global warming. Indonesia aims to achieve 23% of renewable energy by 2025 until 2018, Indonesia reached 8% [1] The global technical potential for solar energy is 78,400 PWh/year [2]. The electricity generation by solar energy is still small compared to neighbour countries as seen in Figure 1.



Addition of Solid Recovered Fuel (SRF) to the Bio-drying Process and the Effects of Variation in Air Discharge on Temperature Parameters and Urban Waste Water Content

C Soriano¹, D I Gita², D Pertiwi², A R Rizaldianto² and A D Farhah²

¹ USDA Forest Service, Washington, D.C., [United States of America](#)

² Department of Environmental Engineering, Diponegoro University, Semarang-Indonesia

dayoeimaniargita@students.undip.ac.id

Abstract. Bio-drying is a technology used to reduce water content in waste using microorganisms that naturally increase the temperature in the decomposition process. With this process, the water content can drop more within a month. Bio-drying produces a product in the form of Solid Recovered Fuel (SRF) which is produced from partially degraded waste. To obtain a waste that is not fully stabilized and maintains a high biomass content, degradation of organic compounds is carried out partially. During the bio drying process, temperature affects the degradation process. Temperature affects the bio drying, which will also affect the bio drying product that is indicated by the value of water content. Therefore, in this study, the change of process parameters will be explained, which is in the form of temperature and water content, that is caused by the difference in the air discharge entering the reactor (0, 2, 4, and 6 l/m) with the initial water content of 60%-65%. After 30 days, the optimum airflow is 4 l/m with a decrease in water content of 58.29%; on the last day of the bio drying process (30th day).

1. Introduction

Waste production in Indonesia has increased every year [1]. From the data of the Ministry of Environment and Forestry, it is noted that the total waste in 2017 was 65.8 million tons, and the total waste in 2018 was 65.752 million tons. This number is estimated to increase by an average of one ton per year. However, proper management efforts cannot yet be made because of the high investment required.

One alternative to reduce waste volume is by waste to energy (WTE) technology with an effectiveness of 90% [2]. Waste that can be converted into energy depends on the density, composition, and relative percentage of water content [3]. However, most of the waste in Indonesia is a wet waste with a lower calorific value, which makes it difficult to be burned [4]. Utilization of waste by increasing the calorific value of waste in the bio drying process is one of the excellent and effective solutions for reducing the level of municipal solid waste (MSW) in these conditions [5].

Bio-drying is the decomposition of partial organic substances by utilizing the heat generated by microorganisms that are helped by aeration [6]. The bio drying process only partially stabilizes waste.

