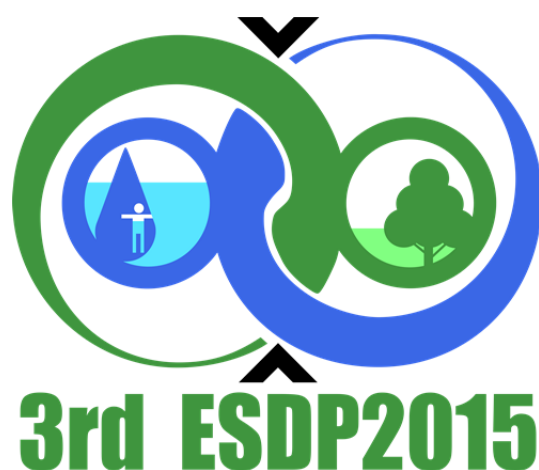


The Third Joint Seminar of Japan and Indonesia  
Environmental Sustainability and Disaster Prevention (3<sup>rd</sup> ESDP-2015)  
Bandung Institut Teknologi, Indonesia – November 25<sup>th</sup>, 2015

# **Environmental Sustainability and Disaster Prevention**

## **PROGRAM BOOK**



The Third Joint Seminar of Japan and Indonesia  
Organized by  
National Institute of Technology, Gifu College (Japan)  
and  
Institut Teknologi Bandung (Indonesia)



# **3rd ESDP 2015**

## *Preface*

Based on the Academic Exchange Agreement concluded between Institut Teknologi Bandung (ITB), Indonesia and National Institute of Technology, Gifu College (NIT, Gifu College), Japan in November, 2011, we, NIT Gifu College and Faculty of Civil and Environmental Engineering (FCEE) of ITB, have started to build up our mutual understanding of the research and education at both institutes.

As a result, FCEE of ITB and NIT, Gifu College agreed to have a joint seminar on “Environmental Sustainability and Disaster Prevention”. They are the two major issues which mega cities in Indonesia and Japan are facing. The 1<sup>st</sup> seminar of “Environmental Sustainability and Disaster Prevention (1<sup>st</sup> ESDP)” was held at ITB on November 21, 2013 as an extension of the International Conference SIBE 2013 hosted by FCEE, ITB for November 19 and 20, 2013. This first seminar jointly opened with two other NITs of Toyota and Numazu attracted more than 150 participants including graduate students of ITB, and successfully elucidated problems to be solved.

The second joint seminar (2<sup>nd</sup> ESDP2015) was held on March 22-24, 2015 by getting participation of other institutes of Leibniz University of Hannover, Germany, Gifu University and National Institute of Technology Fukui College, Japan, and Ministry of Marine Affairs and Fisheries of Indonesia in addition to the original members of ITB and NIT Gifu, Toyota, and Numazu Colleges. This second seminar was supported by Japan Society for the Promotion of Science through the Grant of “Bilateral Open Partnership Joint Seminar Program, Japan and Indonesia” for FY2014, and additionally by the OGAWA Science and Technology Foundation in Ogaki, Japan.

We are very much pleased to have the third joint seminar (3<sup>rd</sup> ESDP2015) to be held again in the campus of ITB on November 25, 2015 as an extension of the 5<sup>th</sup> ETMC (Environmental Technology and Management Conference) organized by FCEE, ITB during November 23 and 24, 2015. This seminar aims to further facilitate our research collaboration on current/future problems likely raised in urban area in Indonesia and Japan in relation to “Environmental sustainability” and “Disaster prevention”.

November 3, 2015

Prof. Toshihiro Kitada

President of National Institute of Technology,  
Gifu College, Japan.

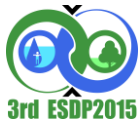
e-mail: [kitada@gifu-nct.ac.jp](mailto:kitada@gifu-nct.ac.jp)

Prof. Ade Sjafruddin

Dean of Faculty of Civil and Environmental  
Engineering,

Institut Teknologi Bandung, Indonesia.

e-mail: [ades@si.itb.ac.id](mailto:ades@si.itb.ac.id)



### Seminar Time Schedule

No	Time	Title
	08.00 - 09.00	Registration
	09.00 - 09.15	Opening Ceremony: Welcoming Address by  Prof Ade Sjafruddin (FCCE ITB) Prof Toshida Kitada (NIT Gifu College)
<b>Part 1 Environmental Sustainability</b>		
E1	09.15 - 09.30	<b>Modeling of Wet Deposition in Chemical Transport Simulation</b> Toshihiro Kitada
E2	09.30 – 09.45	<b>Emission Reduction from Implementation of Bus Rapid Transit Corridor 13th in Jakarta</b> Asep Sofyan, Lailatus Siami, and Russ Bona Frazila
E3	09.45- 10.00	<b>Estimation of Total Carbon Emission from Forest Fires: Case Study of Borneo Island</b> Arno Adi Kuntoro, Ade Wahyu, and Hendri
E4	10.00 - 10.15	<b>Photosensitivity of Graphitic Carbon Nitride Films Obtained by Evaporation</b> Hitoe Habuchi
E5	10.15 - 10.30	<b>Evaluation of Continuous and Filter-Based Methods for Measuring Pm<sub>2.5</sub> Mass Concentration in Bandung Urban Area</b> Fatimah Dinan Qonitan, Puji Lestari, and Haryo S. Tomo
	10.30 – 10.45	<b>Break</b>



E6	10.45- 11.00	<p align="center"><b>Roadside Air Pollution Reduction Technology by Activated Carbon Fibers</b> Masaaki Yoshikawa</p>
E7	11.00 - 11.15	<p align="center"><b>Development of the Siphon System Pipe-Type Fishway and Monitoring of Fish Migration</b> Kiyoshi Wada</p>
E8	11.15 - 11.30	<p align="center"><b>The Influence of Economic and Demographic Factors to Waste Generation in Capital City of Java and Sumatera</b> Benno Rahardyan, Gita Prajati, and Tri Padmi Damanhuri</p>
E9	11.30 – 11.45	<p align="center"><b>Carbon Reduction Optimization in Waste Treatment Using Decentralized System with the Application of A Joint Credit Mechanism</b> Agustina Cindy Widyanggita and Priana Sudjono</p>
E10	11.45- 12.00	<p align="center"><b>Degradation of Degradable Plastics on Several Solid and Liquid Media</b> Emenda Sembiring and Yufienda Novitasari</p>
	12.00 - 13.00	<b>Lunch Break</b>
E11	13.00 - 13.15	<p align="center"><b>Changes in Soil Characteristics Under Sarimukti Landfill, West Bandung Regency</b> Febrian Hadinata, Benno Rahardyan, and Enri Damanhuri</p>
E12	13.15 - 13.30	<p align="center"><b>Relationship Population Density of Aquatic Sediment Macrozoobenthos to River Water Quality Parameters (Case Study: Citarum Upstream, Subdistrict Kertasari, Bandung Regency)</b> Barti Setiani Muntalif, Mohammad Faiz Faza, and Nurul Chasanah</p>
E13	13.30 – 13.45	<p align="center"><b>From MDGs to SDGs: What Will It Take? Towards Sustainable and Safe Water Supply for All</b> Anindrya Nastiti</p>



E14	13.45- 14.00	<p><b>Government Support Towards Community to Wastewater Management in Urban Slum Area (Case Study: Metropolitan Bandung Area)</b> Iendra Sofyan, Prayatni Soewondo, Tresna Darmawan Kunaefi, and Marisa Handajani</p>
E15	14.00 - 14.15	<p><b>Study of Socio-Economic and Environment Impacts of Inconventional Tin Mining (A Case Study: Bangka Barat District of Bangka Belitung Province)</b> Fahrika Erwana, Kania Dewi, and Benno Rahardyan</p>
<b>Part 2 Disaster Prevention</b>		
D1	14.15 - 14.30	<p><b>An Importance of Past Disaster Records -A Case Study of Its Application After The Noubi Earthquake in Gifu-</b> Takahiro Shimizu</p>
D2	14.30 – 14.45	<p><b>Time-Series Analysis on Mass Media Report and Utilization Analysis on Social Media – Case of Local Railway</b> Jun Sakamoto</p>
D3	14.45- 15.00	<p><b>A Prototype of Location Information Infrastructure Using iBeacon for the Bicycle Touring*</b> Koji Tajima</p>
	15.00 - 15.15	<b>Break</b>
D4	15.15 - 15.30	<p><b>Updating Progress of the National Seismic Hazard Map - Indonesia : Crustal Deformation Perspective</b> Irwan Meilano, Masyhur Irsyam, Susilo, Hasanuddin Z. Abidin , Achraf Koulali and Phil Cummins</p>
D5	15.30 – 15.45	<p><b>Enhancing Climate-Related Disaster Resilience Through Effective Risk Communication in Bandung, Indonesia</b> Farah Mulyasari</p>



**The Third Joint Seminar of Japan and Indonesia Environmental Sustainability and Disaster Prevention (3<sup>rd</sup> ESDP-2015)**

Bandung Institut Teknologi, Indonesia – November 25<sup>th</sup>, 2015

D6	15.45- 16.00	<b>Development of Earthquake Risk Assessment Model for Roads in Indonesia</b> Mona Foralisa Toyfur, Krishna S. Pribadi, Sony S. Wibowo, I Wayan Sengara
D7	16.00 – 16.15	<b>On the Importance of GPS Sea Floor Deformation for Disaster Risk Reduction in Java, Indonesia</b> N. Rahma Hanifa, Endra Gunawan, Irwan Meilano, and Udrekhanif
D8	16.15 – 16.30	<b>Development of Collaborative Model in Earthquake Disaster Risk Analysis at Community Level</b> Aria Mariany
	16.30 – 16.45	Closing



# 3rd ESDP 2015

## *Contents*

### *Preface*

### *Seminar Time Schedule*

- E1 Modeling of Wet Deposition in Chemical Transport Simulation**  
Toshihiro Kitada
- E2 Emission Reduction from Implementation of Bus Rapid Transit Corridor 13th in Jakarta**  
Asep Sofyan, Lailatus Siami, and Russ Bona Frazila
- E3 Estimation of Total Carbon Emission from Forest Fires: Case Study of Borneo Island**  
Arno Adi Kuntoro, Ade Wahyu, and Hendri
- E4 Photosensitivity of Graphitic Carbon Nitride Films Obtained by Evaporation**  
Hitoe Habuchi
- E5 Evaluation of Continuous and Filter-Based Methods for Measuring Pm2.5 Mass Concentration in Bandung Urban Area**  
Fatimah Dinan Qonitan, Puji Lestari, and Haryo S. Tomo
- E6 Roadside Air Pollution Reduction Technology by Activated Carbon Fibers**  
Masaaki Yoshikawa
- E7 Development of the Siphon System Pipe-Type Fishway and Monitoring of Fish Migration\***  
Kiyoshi Wada
- E8 The Influence of Economic and Demographic Factors to Waste Generation in Capital City of Java and Sumatera**  
Benno Rahardyan, Gita Prajati, and Tri Padmi Damanhuri
- E9 Carbon Reduction Optimization in Waste Treatment Using Decentralized System with the Application of A Joint Credit Mechanism**  
Agustina Cindy Widyanggita and Priana Sudjono
- E10 Degradation of Degradable Plastics on Several Solid and Liquid Media**  
Emenda Sembiring and Yufienda Novitasari
- E11 Changes in Soil Characteristics Under Sarimukti Landfill, West Bandung Regency**  
Febrian Hadinata, Benno Rahardyan, and Enri Damanhuri



- E12 Relationship Population Density of Aquatic Sediment Macrozoobenthos to River Water Quality Parameters  
(Case Study: Citarum Upstream, Subdistrict Kertasari, Bandung Regency)**  
Barti Setiani Muntalif, Mohammad Faiz Faza, and Nurul Chasanah
- E13 From MDGs to SDGs: What Will It Take? Towards Sustainable and Safe Water Supply for All**  
Anindrya Nastiti
- E14 Government Support Towards Community to Wastewater Management in Urban Slum Area (Case Study: Metropolitan Bandung Area)**  
Iendra Sofyan, Prayatni Soewondo, Tresna Darmawan Kunaefi, and Marisa Handajani
- E15 Study Of Socio-Economic and Environment Impacts of Inconventional Tin Mining (A Case Study: Bangka Barat District Of Bangka Belitung Province)**  
Fahrika Erwana, Kania Dewi, and Benno Rahardyan
- D1 An Importance of Past Disaster Records -A Case Study of Its Application After The Noubi Earthquake in Gifu-**  
Takahiro Shimizu
- D2 Time-Series Analysis on Mass Media Report and Utilization Analysis On Social Media – Case Of Local Railway**  
Jun Sakamoto
- D3 A Prototype of Location Information Infrastructure Using iBeacon for the Bicycle Touring\***  
Koji Tajima
- D4 Updating Progress Of The National Seismic Hazard Map-Indonesia : Crustal Deformation Perspective**  
Irwan Meilano, Masyhur Irsyam, Susilo, Hasanuddin Z.  
Abidin, Achraf Koulali, and Phil Cummins
- D5 Enhancing Climate-Related Disaster Resilience Through Effective Risk Communication In Bandung, Indonesia**  
Farah Mulyasari
- D6 Development of Earthquake Risk Assessment Model For Roads In Indonesia**  
Mona Foralisa Toyfur, Krishna S. Pribadi, Sony S. Wibowo, I Wayan Sengara
- D7 On The Importance of GPS Sea Floor Deformation For Disaster Risk Reduction In Java, Indonesia**  
N. Rahma Hanifa, Endra Gunawan, Irwan Meilano, and Udrekhan Hanif





- D8 Development Of Collaborative Model In Earthquake Disaster Risk Analysis At Community Level**  
Aria Mariany
- P1 Application of Contingent Valuation Method in Sanitation Quality Improvement Efforts at Cikapundung Rivers in Bandung City**  
Luthfan Jatnika and Benno Rahardyan
- P2 Content of Heavy Metals in The Water and Water Hyacinth (*Eichhornia Crassipes*) in Water Bodies Receiving Wastewater from Textile Industry (Case Study: Cikacembang River, Majalaya Districts, Bandung Regency)**  
Fathunnisa and Indah Rachmatiah Siti Salami
- P3 Nitrification Kinetics in Aquaculture Wastewater Treatment Using Batch Reactor**  
Aini Zahra and Marisa Handajani
- P4 Modification of Tripikon-S with Bioball Addition in Artificial Black Water Treatment for Swamp and Coastal Areas**  
Dewi Fitria Marlisa, Dyah Wulandari Putri, and Prayatni Soewondo
- P5 Influenced Factors of Structure for Wastewater Treatment System in Challenging Area, (Case Study: Palembang City, South Sumatera Province, Indonesia)**  
Dian P. Apriadi, Dyah Wulandari Putri, and Prayatni Soewondo
- P6 The Removal of Organic Substance Using the Modified Tripikon S for The Usage in Coastal and the Swamp Areas**  
Dian Ardina Kusumaningayu, Dyah Wulandari Putri, and Prayatni Soewondo
- P7 Material Flow Analysis of Vegetables Waste Caused by Horticultural Activity (Case Study: Bandung City)**  
Faruq Nejaridwana, Tri Padmi Damanhuri, and Benno Rahardyan
- P8 The Development Of Environmentally Friendly Pavement Using Titanium Dioxide (TiO<sub>2</sub>) For Reduction Of Nitrogen Oxides (NO<sub>x</sub>) Gas**  
I Made Bayu, Kania Dewi, and Moh. Irsyad
- P9 Analytic Hierarchy Process for the Evaluation of Transport Policies in Bandung City**  
Ferry Irawan Kartasmita, Asep Sofyan, Bona Frazila, and I Made Bayu



## MODELING OF WET DEPOSITION IN CHEMICAL TRANSPORT SIMULATION

Toshihiro Kitada\* †

National Institute of Technology, Gifu College Japan

Email: kitada@gifu-nct.ac.jp

\*Presenter; † Corresponding author.

**Abstract:** Transport/chemistry/deposition model for atmospheric trace chemical species is now frequently used as an important tool to assess the effects of various human activities, such as fuel combustion and deforestation, on human health, eco-system, and climate. In the analysis of the serious release of radioactive species from the accident of Fukushima Daiichi Nuclear Power Plant in March, 2011, various models were also applied to estimate the amount of discharged radioactive materials and to understand observed spatial distributions (Sectional Committee on Nuclear Accident, Science Council of Japan, 2014[11]; hereafter abbreviated as SCNA). The SCNA report shows that results of some models and also ensemble average of the calculated results of all the participated models successfully captured main features of horizontal distribution of the accumulated deposition of <sup>137</sup>Cs. However, it seems there are still by factors of 5 and 1/5 differences between observed and calculated results at the largest. Thus in this paper I like to show our previous attempts on wet deposition in chemical transport simulation for reference to think about the phenomena. The chemical transport model is required to reproduce correctly mass balance of various chemical species in the atmosphere with keeping adequate accuracy for calculated concentration distributions of chemical species. For the purpose, one of the important problems is a reliable wet deposition modeling, and here, we introduce two types of methods of “cloud-resolving” and “non-cloud-resolving” modeling for the wet deposition of pollutants.

**Keywords:** Air pollution; transport modeling; wet deposition; cloud resolving/non-resolving.

ESDP 3-E1

## EMISSION REDUCTION FROM IMPLEMENTATION OF BUS RAPID TRANSIT CORRIDOR 13<sup>th</sup> IN JAKARTA

Asep Sofyan<sup>1†\*</sup>, Lailatus Siami<sup>2</sup>, and Russ Bona Frazila<sup>3</sup>

<sup>1,2</sup>Environmental Engineering Department, Institut Teknologi Bandung, Jl. Ganesha No. 10, Bandung, Indonesia.

Email: asepsofyan@yahoo.com

<sup>3</sup>Civil Engineering Department, Institut Teknologi Bandung, Jl. Ganesha No. 10, Bandung, Indonesia

\*Presenter; † Corresponding author.

**Abstract:** Green transport nowadays become important concern related to emission reduction. This is also become one of policy brief in Jakarta Macro Transportation (JTM) plan. Busway or so-called BRT as one of reliable mass transportation in Jakarta has been developed for 12 corridor. 13<sup>th</sup> corridor is planned as elevated with length 14.6 km typed 2 lanes 2 way. Are this scenario will be significantly affect for emission reduction? This main question will be figured out in this research. Eventually, emission of transportation sector in Indonesia reached almost 200 Gg/year up to 2012. In the research, road networking model is used for representing actual condition of complex urban road in Jakarta. By the result of road assignment, will be estimated the traffic volume every road. Hence, Emission load calculated by bottom – up emission inventory and carried out from road segmentation. Afterwards, emission will be mapped out by spatial distribution resolution 1 km x 1 km that reveals emission reduction due to development of busway 13<sup>th</sup> is 9% of all emission, respectively. This sufficiently high rate of emission reduction due to fuel shift from fossil fuel to gas considered.

**Keywords:** busway corridor 13<sup>th</sup>, road networking model, emission inventory, load emission

ESDP 3-E2



## ESTIMATION OF TOTAL CARBON EMISSION FROM FOREST FIRES: CASE STUDY OF BORNEO ISLAND

Arno Adi Kuntoro<sup>1,\*†</sup>, Ade Wahyu<sup>2</sup>, and Hendri<sup>3</sup>

<sup>a</sup>Faculty of Civil and Environmental Engineering

<sup>a</sup>Institut Teknologi Bandung, <sup>b</sup>Ministry of Environment and Forestry of Indonesia,

<sup>c</sup>Universitas Papua <sup>a,b,c</sup>Indonesia

Email: <sup>1</sup>arnoak@ftsl.itb.ac.id, <sup>2</sup>wahyuforester@yahoo.com, <sup>3</sup>hendri888@gmail.com

\* Presenter; † Corresponding author.

**Abstract:** The availability of combustible materials and their flammability are important aspects in forest fires studies, especially to predict the total carbon emission to the atmosphere. From point of view of earth system modeling, Dynamic Global Vegetation Model (DGVM) provides most of the basic computations for simulating the interactions between terrestrial ecosystem and the atmosphere, including carbon accumulation in vegetation bodies, litter and soil/peat, by considering the effect of climate conditions and its variability. In this study, a modified Lund Potsdam Jena Dynamic Global Vegetation Model (LPJ-DGVM) for application in tropical area is used to simulate the total amount of carbon emitted to the atmosphere in Borneo Island from 1980 to 2006. Simulation results show that the annual average carbon emission from forest fire in Borneo Island is 0.02 to 0.06 GtC/y, with the highest emission during 1997-1998 El-Niño event, which is about 0.05 GtC if only considering the burned of aboveground vegetation, to about 0.62 GtC by also considering the burned of peat layer.

**Keywords:** DGVM, forest fire, carbon emission, Borneo

ESDP 3-E3

## PHOTOSENSITIVITY OF GRAPHITIC CARBON NITRIDE FILMS OBTAINED BY EVAPORATION

Hitoe Habuchi<sup>a,\*†</sup>, Shiori Fujita<sup>a</sup>, Hirofumi Takikawa<sup>b</sup>,

<sup>a</sup>National Institute of Technology, Gifu College, Japan

<sup>b</sup>Toyohashi University of Technology, Japan

Email: habuchi@gifu-nct.ac.jp, 2014s17@edu.gifu-nct.ac.jp, and takikawa@ee.tut.ac.jp

\* Presenter; † Corresponding author.

**Abstract:** Graphitic carbon nitride (g-C<sub>3</sub>N<sub>4</sub>) comprises a two-dimensional sheet of carbon and nitrogen atoms. In the present study, g-C<sub>3</sub>N<sub>4</sub> films were prepared by evaporating guanidine carbonate for evaluating the photosensitivity of the films. The X-ray diffraction peak of the g-C<sub>3</sub>N<sub>4</sub> films was observed at  $2\theta = 27.6^\circ$ , corresponding to interlayer stacking. The N/C atomic ratio obtained by energy dispersive X-ray spectroscopy was approximately 133%. The results indicated characteristics associated with two-dimensional carbon and nitrogen atom structures. The optical energy gap was estimated to be 2.88 eV at N/C = 136%, and it decreased with elevation in substrate temperature. Photosensitivity spectra were obtained by irradiation with monochromatic light. The photocurrent originated from electronic transition between energy bands because the photon energy at which the photosensitivity increases was consistent with the optical energy gap.

**Keywords:** graphitic carbon nitride; photosensitivity; photocurrent; optical absorption spectra

ESDP 3-E4



## EVALUATION OF CONTINUOUS AND FILTER-BASED METHODS FOR MEASURING PM<sub>2.5</sub> MASS CONCENTRATION IN BANDUNG URBAN AREA

Fatimah Dinan Qonitan<sup>1\*†</sup>, Puji Lestari<sup>2†</sup>, and Haryo S. Tomo<sup>3</sup>

Master Program of Environmental Engineering

Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung Jalan Ganesha No. 10, Bandung 40132

E-mail: <sup>1</sup>fdinanq@gmail.com, <sup>2</sup>pujilest@indo.net.id, <sup>3</sup>haryotomo@gmail.com

\*Presenter; † Corresponding author.

**Abstract:** Assessing the effects of air pollution to public health requires continuous and accurate measurements of particle with aerodynamic diameter  $< 2,5 \mu\text{m}$  (PM<sub>2.5</sub>). This study seeks to evaluate sampling performance of samplers from newly established monitoring network, Surface Particulate Matter Network-SPARTAN for PM<sub>2.5</sub> mass concentration measurements at an urban site in Bandung, Indonesia. Sampling were carried out during January-August 2014 where a filter based sampler, AirPhoton® Filter Sampler, an automated continuous sampler, AirPhoton® Nephelometer, operated in parallel and simulated with the reference instrument, Harvard Impactor. 21 days intercomparison study showed good agreement ( $R^2=99,4\%$  P-Value=0,000) between PM<sub>2.5</sub> mass concentration measured by two filter based method, Filter Sampler ( $\bar{x}=31,55 \mu\text{g}/\text{Nm}^3$ ) and Harvard Impactor ( $\bar{x}=34,10 \mu\text{g}/\text{Nm}^3$ ). Nephelometer backscatter in 532 nm wavelengths (green) resulted hourly estimates of PM<sub>2.5</sub> mass concentration. Hourly estimates of PM<sub>2.5</sub> has  $\bar{x}=36,754 \mu\text{g}/\text{Nm}^3$  and stdev=20,610  $\mu\text{g}/\text{Nm}^3$ , which is similar with filter-based measurement result,  $\bar{x}=36,80 \mu\text{g}/\text{Nm}^3$  and stdev=8,04  $\mu\text{g}/\text{Nm}^3$ .

**Keywords:** fine particulate, urban, nephelometer, filter, impactor

ESDP 3-E5

## ROADSIDE AIR POLLUTION REDUCTION TECHNOLOGY BY ACTIVATED CARBON FIBERS

Masaaki Yoshikawa<sup>a,\*†</sup>, Takaaki Shimohara<sup>b</sup>, Toshihiro Kitada

<sup>a</sup>Osaka Gas co., ltd., Osaka, Japan, Email: yoshikaw@osakagas.co.jp

<sup>b</sup>Kyushu University, Fukuoka, Japan,

Email: shimohara@cm.kyushu-u.ac.jp

<sup>c</sup>National Institute of Technology, Gifu College, Japan,

Email: kitada@gifu-nct.ac.jp

\* Presenter; † Corresponding author.

**Abstract:** The technology against air pollution using Activated Carbon Fibers (ACF) does not use the electric power and utilizes only the natural wind. Our research group has developed the ACF unit for roadside that can remove air pollutants by parallel wind flow through slit shape structure. Japanese Ministry of Land, Infrastructure, Transport and Tourism (MLIT) has been proceeded the installation of ACF unit at the national highway where the air pollution from traffic was very severe since 2007. Observed NO<sub>2</sub> and NO removal at the roadside was 84% and 19% on average, respectively. The duration of ACF is enhanced by catalytic performance to oxidize NO<sub>x</sub> into NO<sub>3</sub><sup>-</sup> ion, which can be washed out by rain fall easily. Estimated duration of ACF at the roadside is assumed for over 7 years.

**Keywords:** activated carbon fibers, air pollution, roadside, nox, micro porous

ESDP 3-E6



## DEVELOPMENT OF THE SIPHON SYSTEM PIPE-TYPE FISHWAY AND MONITORING OF FISH MIGRATION

Kiyoshi Wada <sup>a,\*</sup>, Yukio Ota <sup>b</sup>,

<sup>a</sup>Department of Civil Engineering, National Institute of Technology, Gifu College, Japan

Email: wada@gif-nct.ac.jp

<sup>b</sup> Research Center, Nishi-Nippon Institute of Technology, Fukuoka, Japan

Email: otayukio@sage.ocn.ne.jp

\*Presenter; † Corresponding author.

**Abstract:** In this study, the function of fishway was evaluated using preliminary data, the siphon-pipe type fish passage with cost performance and portability has been developed, and local river experiment with indigenous fish was conducted. The structure form that the flow velocity should be reduced below at the burst swimming speed of fishes was examined. As results, dissipative energy can be attenuated greatly by the form loss of joints. The calculation formula of the design flow velocity and the required number of joint was proposed. The siphon-pipe fishway was designed using this formula, and the amount of ascension of the indigenous fish by local river experiment was investigated. Although the complete range of the fishes used for the experiment permeated into the pipe, the Oikawa (*Zacco platypus*) ascended to exit of the fish passage for a short time, and it is the whole dominate species. This fish passage can be used for choosing fishes, as the predetermined flow velocity is changed. It was shown that the ascension difficulty of fishes is cancelled by installation of the siphon-pipe type fish passage. A siphon system pipe-type fishway have several typical characteristics, such as free from overflowing, not expensive, easy to make, transport and install, and some pipe-type fishways already works as tentative fishways and semi- permanent fishways in Japan. Therefore, as a pipe-type fishway has high flexibility of design, siphon-pipe fish passage is effective in improving the river ecological habitat.

**Keywords:** fishway design, pipe-type fishway, siphon migration, habitat

ESDP 3-E7



## THE INFLUENCE OF ECONOMIC AND DEMOGRAPHIC FACTORS TO WASTE GENERATION IN CAPITAL CITY OF JAVA AND SUMATERA

**Benno Rahardyan<sup>1,\*†</sup>, Gita Prajati<sup>2</sup>, and Tri Padmini<sup>3</sup>**

Master Program of Technology Environmental Management

Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung Jalan Ganesha 10 40132

E-mail: <sup>1</sup>benno.rahardyan@gmail.com, <sup>2</sup>gitaprajati@yahoo.co.id, <sup>3</sup>tripadmi@gmail.com

\*Presenter; † Corresponding author.

**Abstract:** Along with population's growth, industrialization, urbanization, and economy's growth, giving impact to the increase of total of solid waste in Urban. The purpose of this research is analyzing the relation between Economical, Social, and Demography variables to Waste generation and identifying local patterns which related to the development of Waste generation in Java and Sumatera. This observation analyzes relation between Economical, Social, and Demography variables to Solid waste. Then, do model test of Khajuria and Daskalopoulos, also analysis of Cluster, Quadrant, and Claassen Typology to get the pattern of characteristic and waste generation in Java and Sumatera. The result of Daskalopoulos model test showing waste generation in Java and Sumatera can be explained 33.7 % by consumption outcome per category. The result of Khajuria model test showing waste generation in Java and Sumatera can be explained 21.8 % by Total number of population, Gross Domestic Product, and School's period. There are three patterns that based on characteristics and Economy activity. First pattern is group of cities with low waste generation that characterized by low growth in Economy also economy activity in Port/Trade and Trade/Plantation. Second pattern is group of cities with high waste generation, low growth in economy and high consumption also economy activity in industry/trade. For third pattern which characterized by highly waste generation, economic growth, and Gross Domestic Product, also economy activity in industry/trade.

**Keywords:** waste generation, model test, cluster analysis, economy activity.

ESDP 3-E8



## CARBON REDUCTION OPTIMIZATION IN WASTE TREATMENT USING DECENTRALIZED SYSTEM WITH THE APPLICATION OF A JOINT CREDIT MECHANISM

Agustina Cindy Widyanggita<sup>1,\*†</sup> and Priana Sudjono<sup>2</sup>

Master Programme for Environmental Engineering

Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung Jl Ganesha 10 Bandung 40132

Email: agustina.winardhi@gmail.com<sup>1</sup>, psudjono@comices.org<sup>2</sup>

\*Presenter; † Corresponding author.

**Abstract:** The volume of waste generated in Bandung is increasing along with the increase of population and its activities. Through the process of natural degradation, garbage produces carbon emissions as what happened in waste treatment process. Responding to the waste problem in Bandung related to carbon emissions, it is necessary to make an optimization model to determine the best waste processing techniques for each area in Bandung which are divided by a decentralized system. Reduction in waste treatment costs are obtained from incentive which refers to the joint credit mechanism pattern, while the optimization model using linear programming will be solved using simplex method. Simulation of optimization model is run with a condition where service scope for waste is 70% with middle income people of 40% and low income people of 60%. According to mass balance concept, for 30% emission reduction target, Bandung Utara, Bandung Barat, and Bandung Selatan mostly use composting as their waste treatment with the input allocation of 90%, 99%, and 90% from the total amount of waste in each region, respectively, while Bandung Timur use sanitary landfill the 100% input of waste. When the same condition is applied but the constraint is changed into combined emission reduction for whole Bandung, the operational cost is reduced as much as 998.1 million rupiah from initial cost. From this study, linear programming can be used for determining waste treatment plant with emissions constraints for making government's policy.

**Keywords:** organic waste, joint credit mechanism (JCM), optimization, linear programming

ESDP 3-E9



## DEGRADATION OF DEGRADABLE PLASTICS ON SEVERAL SOLID AND LIQUID MEDIA

Emenda Sembiring<sup>1,\*†</sup> and Yufiend Novitasari<sup>2</sup>

Environmental Engineering Study Program, Faculty of Civil and Environmental Engineering  
Institut Teknologi Bandung

Email: emenda@ftsl.itb.ac.id<sup>1</sup> and yufiend.novitasari@gmail.com<sup>2</sup>

\* Presenter; † Corresponding author.

**Abstract:** Plastics on the market are usually made by synthetic polymers that are difficult to decompose in nature. To reduce the impact of plastic waste, nowadays biodegradable and degradable plastics have been introduced into the market. The availability of degradable plastics on the market attracts local government in Bandung to use degradable plastics for waste storage especially on the road side. Therefore, this study evaluates the end life of degradable plastics in solid and liquid media: soil, waste, composting and water. Two types of plastic materials, @Ecoplas and @Oxium are investigated. @Ecoplas is made from natural materials, such as starch, so it can be degraded biologically. @Oxium is made from additional additive substance that is mixed into pure plastic raw materials in order to speed up the oxidation process. The plastics were inserted into the soil and waste media for 90 days, composting media for 50 days, anaerobic condition for 21 days, and the river media for 21 days. To confirm the degradability, a series of measures was conducted by measuring the weight and tensile strength. Scanning Electron Microscopy (SEM) test was also conducted to see the morphology of plastics during the experiments. The average of weight loss for @Ecoplas was up to 31% and for @Oxium was up to 20% during 90 days in waste media, whereas, in the soil the average weight loss for @Ecoplas and @Oxium was up to 33% and 28% during 21 days consecutively. For the tensile strength test, @Ecoplas has decreased 25-27% and @Oxium has decreased 16- 17% in soil and waste media.

**Keywords:** biodegradable plastics, degradable plastics, degradability, solid media, liquid media

ESDP 3-E10





## CHANGES IN SOIL CHARACTERISTICS UNDER SARIMUKTI LANDFILL, WEST BANDUNG REGENCY

Febrian Hadinata<sup>1</sup>, Benno Rahardyan<sup>2</sup>, and Enri Damanhuri<sup>3</sup>

<sup>1</sup> Doctoral Program of Environmental Engineering Institut Teknologi Bandung <sup>2,3</sup> Faculty of Civil and Environmental  
Engineering Institut Teknologi Bandung Jl. Ganesha No. 10, Bandung, Indonesia

Email: febian.hadinata@yahoo.co.id, benno@ftsl.itb.ac.id<sup>3</sup>, and enridamahuri@gmail.com

\*Presenter; † Corresponding author.

**Abstract:** The volume of landfill leachate in Indonesia is quite high, due to the closure of waste is not done on a daily basis. And if the liner layer is not available or is not working properly, then the leachate will go directly to the bottom soil layer. Characteristics of the soil at the base of the landfill may be subject to change due to seepage of leachate from rubbish on it. This study examines changes in the physical characteristics of the soil under the landfill, which include; plasticity index, grain size analysis and the specific gravity. Sampling was conducted at the landfill Sarimukti, West Bandung regency. Samples were taken to look at the possibility of changes in soil characteristics, by comparing karakteristik ground under the landfill (6 samples) and outside the landfill (2 samples). From the results, it can be concluded that there is no significant difference between the Specific Gravity ground under the landfill and outside the landfill, there is no difference between the grain size distribution of the soil beneath and outside the landfill, while the Plasticity Index land under landfill higher than in outside the landfill, so it has the ability to absorb water and develop higher shrinkage

**Keywords:** infiltration, landfill, leachate, physical characteristics, soil

ESDP 3-E11

## RELATIONSHIP POPULATION DENSITY OF AQUATIC SEDIMENT MACROZOOBENTHOS TO RIVER WATER QUALITY PARAMETERS (Case Study: Citarum Upstream, Subdistrict Kertasari, Bandung Regency)

Barti Setiani Muntalif<sup>1\*</sup>†, Mohammad Faiz Faza<sup>2</sup>, and Nurul Chasanah<sup>3</sup>

Master Program of Environmental Engineering

Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung, Jl. Ganesha No. 10 Bandung 40132

Email: <sup>1</sup>barti\_setiani@yahoo.com and <sup>2</sup>mohammad.faiz19@gmail.com

\* Presenter; † Corresponding author.

**Abstract:** The increase in anthropogenic activities that occur along the Citarum river basin upstream segment, District Kertasari, Bandung regency, have a negative impact on water quality of the river with the presence of input waste into the water body which is the remainder of the result of human activity, and also cause disruption to the aquatic biota that live in it. The purpose of this study was to determine the relationship of the changes conditions of water and sediment parameters on macrozoobenthos populations. The results showed that based on the Pearson correlation analysis are known parameters COD, TOC and silt have the highest correlation value of the macrozoobenthos population density of 0.966, 0.865 and 0.576. In addition, with the use of PCA analysis known that water temperature, TSS, turbidity, TOC, COD, BOD and water pH is a major component of water parameters that affect the density of macrozoobenthos. Whereas, for the parameters of sediment obtained that parameter silt substrate, clay substrate, total phosphate sediment and gravel that affect the density of macrozoobenthos. The results also showed that based on biotic index (BMWP-ASPT) water conditions were in polluted condition of mild to severe, and from the pollution index (IP) shows the light polluted conditions.

**Keywords:** Citarum upstream, macrozoobenthos population density, water quality, correlation

ESDP 3-E12



## FROM MDGS TO SDGS: WHAT WILL IT TAKE? TOWARDS SUSTAINABLE AND SAFE WATER SUPPLY FOR ALL

Anindrya Nastiti\*†

Environmental Management Technology

Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung, Jl. Ganeca 10 Bandung

Email: anindrya@tl.itb.ac.id

\*Presenter; † Corresponding author.

**Abstract:** This paper reviews the history of international water supply policy from the early 1980s to the Sustainable Development Goals. Strives to achieve universal access to water and improving service quality, SDG water framework demands for a more complex monitoring framework and both generalized and localized target. This paper serves as an advocacy tool as that demand attention to the problems of service quality in water sector, as well as reflective tool to make sure that we are going to the right direction towards sustainable access of safe water for all.

**Keywords:** Water supply policy, MDGs, SDGs, sustainable water supply

ESDP 3-E13

## GOVERNMENT SUPPORT TOWARDS COMMUNITY TO WASTEWATER MANAGEMENT IN URBAN SLUM AREA (Case Study: Metropolitan Bandung Area)

Iendra Sofyan<sup>1,\*†</sup>, Prayatni Soewondo<sup>2</sup>, Tresna Darmawan Kunaefi<sup>3</sup>, and  
Marisa Handajani<sup>5</sup>

Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung Ganesha 10 Bandung 40132

Email: iendra@hotmail.com<sup>1</sup>

\*Presenter; † Corresponding author.

**Abstract:** Sanitation is one of the development aspects which are mankind basic necessity. Government support plays an important role in sanitation achievement. One of sanitation development policy in Indonesia refers to community needs (demand driven) rather than achieving technical target (supply driven). The development pattern has positioned community to play a major role in development process and become an active participant in facility planning, construction, utilization and maintenance. This research is intended to explore importance factor for community in sanitation management. Research location is in Greater Bandung Area which is West Java Province capital area. In the area without government intervention, among ten requested importance factors, the financial factor becomes a major importance factor that had to be improved, nevertheless community participation, environmental and social impacts factors are satisfied important factors. On the contrary, in area with government intervention there are other factors appear than those mentioned factors which are institution and technology. This indicates government socialization and empowerment effort has opened community perception that sanitation management needs legitimate institution and suitable alternative technology.

**Keywords:** government, community, sanitation, slumarea

ESDP 3-E14

## STUDY OF SOCIO-ECONOMIC AND ENVIRONMENT IMPACTS OF INCONVENTIONAL TIN MINING (A Case Study: Bangka Barat District of Bangka Belitung Province)

Fahrika Erwana<sup>1\*</sup>, Kania Dewi<sup>2†</sup> and Benno Rahardyan<sup>3</sup>

<sup>1,2,3</sup>Program Magister Teknik Lingkungan, Institut Teknologi Bandung

Jl. Ganesha 10 Bandung 40132

Email: fahrika.erwana59@gmail.com<sup>1</sup>, kaniadewi@ftsl.ac.id<sup>2</sup>, and benno@ftsl.itb.ac.id<sup>3</sup>

\*Presenter; † Corresponding author.

**Abstract:** This study is a measurement and evaluation of the impact of unconventional tin mining on the social and economic conditions, as well as the environmental damage caused by tin mining in the district of West Bangka of Bangka Belitung province. Data were obtained from questionnaires, observation, and literature review. Firstly, questionnaire need to be tested its validity and reliability before continued to assess awareness and perception. In addition there will be path analysis to observe the influence of variables to perception of social, economic and environment impacts. The study involved 400 randomly selected respondents in the two sub districts in the District of West Bangka, they are Mentokand Jebus. Observation result showed that the unconventional tin mining gives negative impact on the environment and social conditions, but it gives a positive impact on the economic conditions. Based on path analysis, variables of awareness, participation, expectation and support unconventional tin mining have significant effect to perception of social, economic and environment impacts.

**Keywords:** Unconventional tin mining, validity, reliability, path analysis

ESDP 3-E15

## IMPORTANCE OF PAST DISASTER RECORDS -A Case Study of Its Application after the Noubi Earthquake in Gifu-

Takahiro Shimizu<sup>\*†</sup>,

Department of Architecture, National Institute of Technology, Gifu College, Japan

Email: t-shimizu@gifu-nct.ac.jp

\* Presenter; † Corresponding author.

**Abstract:** The damage from natural disasters, such as earthquake, typhoon, volcano eruption, and so on, to constructions and cities has happened repeatedly in Japan. It cannot be said the sustainable society, if we just wait for the next disaster with doing nothing and rebuild the infrastructures and buildings each time. As a matter of course, we have learnt many from a lot of disasters and its damage. It is important to record, reconsider and exploit the tragedy as a valuable opportunity what we can learn from. In this study, the simple devices which was based on the remaining records of the Noubi Earthquake, individual measures with technique of trial-and-error by the general people, given to a certain residence is analyzed. To figure out achievements of our predecessors implemented promptly after damage, and to know application of traditional architectural technique to countermeasures against disaster, those are very curious and meaningful experiences. The importance of the approach that considered not only a new approach that used the latest technology but also the traditional approach that had been piled using the experience and wisdom in a word that was rooted in history and culture, through the records, it became clear in this study.

**Keywords:** past disaster records, countermeasures against disaster,  
the noubi earthquake, traditional architecture

ESDP 3-D1



## TIME-SERIES ANALYSIS ON MASS MEDIA REPORT AND UTILIZATION ANALYSIS ON SOCIAL MEDIA - Case of Local Railway-

Jun Sakamoto<sup>a,\*†</sup>, Kazutaka Kubota<sup>b</sup>, and Shotaro Yada<sup>c a</sup>

National Institute of Technology, Gifu College, Japan

Email: sakamoto@gifu-nct.ac.jp

<sup>b</sup> Japan Freight Railway Company, Japan

<sup>c</sup> Central Japan Railway Company, Japan

**Abstract:** In Japan, many local railway companies have serious problems: passenger decrease and motorization. In addition, some of them have been encountered the crisis of bankruptcy. However, they make an effort to operate for not only passengers but also cities. How has mass media reported the fact? The information provided by mass media is important to make public opinion. Also, with the development of internet, it has become easier to spread an individual opinion by social media. Especially, social networking service: SNS, is already recognized as an effective way. In this study, first of all, mass media report of local railway is analyzed. Then, utilization of social media related to the railway is clarified.

**Keywords:** railway, mass media, social networking service, text mining

ESDP 3-D2

## A PROTOTYPE OF LOCATION INFORMATION INFRASTRUCTURE USING iBEACON FOR THE BICYCLE TOURING

Koji Tajima<sup>a,\*†</sup>, Shinya Nakamura<sup>b</sup>, Tadahiko Sato<sup>c</sup>, and Shigeru Kobayashi<sup>d</sup>

<sup>a</sup> Department of Electrical and Computer Engineering, National Institute of Technology Gifu college Email:  
Email: ktajima@gifu-nct.ac.jp

<sup>b</sup> Media Creations Research department, The Institute of Advanced Media Arts and Sciences

<sup>c</sup> TriggerDeviceCo.,Ltd.

<sup>d</sup> Research Center for Industrial Culture, The Institute of Advanced Media Arts and Sciences

\* Presenter; † Corresponding author.

**Abstract:** In recent years, there is much application that uses GPS and it utilizes the location information on smartphones. However, it is difficult to use for a long time because the GPS uses the amount of the battery power. “iBeacon” is one of the devices to get the location information by Bluetooth LE. It can get the location information passively and it can reduce to use amount of the battery power. In this paper, we describe the application for City guide or Bicycle touring using the iBeacon. We developed three types of application for different situations. In addition, we set up the iBeacon for location information infrastructure in the Mino City. Mino City has the traditional streetscape and it is difficult to build a lot of sign of the City. And the City recommends the bicycle touring. So we develop the city guide application and trial running it.

**Keywords:** iBeacon, Location information infrastructure, Bicycle Touring

ESDP 3-D3



## UPDATING PROGRESS OF THE NATIONAL SEISMIC HAZARD MAP- INDONESIA: CRUSTAL DEFORMATION PERSPECTIVE

Irwan Meilano <sup>1,\*†</sup>, Masyhur Irsyam <sup>2</sup>, Susilo <sup>3</sup>, Hasanuddin Z. Abidin<sup>1</sup>, Achraf Koulali <sup>4</sup> and Phil Cummins

<sup>1</sup>Geodesy Research Group, Faculty of Earth Science and Technology, Institut Teknologi Bandung, Indonesia,  
Email: irwanm@gd.itb.ac.id

<sup>2</sup>Geotechnical Engineering Research Group, Faculty of Civil and Environmental Engineering,  
Institut Teknologi Bandung, Indonesia

<sup>3</sup>Agency for Geospatial Information (BIG), Indonesia

<sup>4</sup>RSES Australian National University, Canberra, Australia

**Abstract:** The Indonesian archipelago is located in a tectonically active zone of Eurasian Plate, Indo-Australian Plate, Pacific and Philippine Sea plates. To its west, the Indian oceanic crust is sliding underneath the Sunda Plate, forming a trench system spreading from western Java to northern Sumatra. To its east, subduction gives way to a collision between the Sunda-Banda arc and the submarine Australian continental shelf, leading to upper-plate deformation. Source model for the National Seismic Hazard (NSH) maps is constructed using three types of data: seismicity data, paleo seismic-geologic observations on past earthquake, and GPS constraints on fault slip rates and strain accumulation rates. The model is constructed as a combination of block rotation and strain accumulation in elastic half-space that assumes each fault segment slips beneath a locking depth or in combination with creeping in a shallower part. In this preliminary model, we divided Indonesia into six tectonic blocks and 88 faults.

**Keywords:** Deformation Model, Indonesia, Seismic Hazard

ESDP 3-D4



## ENHANCING CLIMATE-RELATED DISASTER RESILIENCE THROUGH EFFECTIVE RISK COMMUNICATION IN BANDUNG, INDONESIA

Farah Mulyasari<sup>\*†</sup>

Research Center for Disaster Mitigation, Institut Teknologi Bandung

Email: farah.mulyasari@gmail.com

\* Presenter; † Corresponding author.

**Abstract:** Recent publications on climate change risk indices, such as the World Risk Index from Buendnis Entwicklung Hilft and UNU-EHS or the Global Climate Risk Index from German watch that Indonesia is at the top end of the most vulnerable country to climate change and natural hazards. This condition will exacerbate Indonesian urban areas. The 2004 Indian Ocean Tsunami is the turning point for Indonesia in rearranging its institutional framework on disaster risk reduction and climate change adaptation, focusing on institutionalizing local initiatives. The study addresses the linkage of climate disaster resilience and risk communication approaches at the local level. The adoption of Climate Disaster Resilience Index at the micro-city level (sub-district level) of Bandung City, Indonesia, demonstrates an approach to disclose the resilience of physical, social, economic, institutional, and natural dimensions of different areas within the city. The focus on resilience aims to foster actions enhancing the capacity of the city to future climate-related disasters through adequate planning decisions. Enabling this, communication envisages as the last mile of this comprehensive climate-related disaster resilience assessment on how the risk and resilience information collected at and conveyed to the public. Community-Based Society Organizations of Bandung has the potential in conveying that information to wider communities, which would trigger them to take actions. A set of indicators in Social Institutional and Economic Resilience Activities approach is developed to characterize the delivering process of risk information by community organizations through their activities at sub-districts and wards. Results indicate that communities' organization activities in Bandung implement a certain degree of risk communication, which is embedded in their activities by involving the local government, agencies, private sector and media in the process. As the output, the study offers a model of comprehensive risk communication approach; integrating climate-related disaster assessment and risk communication processes driven by local novel initiatives in city.

**Keywords:** disaster risk reduction, climate change adaptation, resilience, risk communication

ESDP 3-D5



## DEVELOPMENT OF EARTHQUAKE RISK ASSESSMENT MODEL FOR ROADS IN INDONESIA

Mona Foralisa Toyfur\* †, Krishna S. Pribadi, Sony S. Wibowo, I Wayan Sengara

Department of Civil Engineering, Institute Technology Bandung

Email: monatoyfur@gmail.com

\* Presenter; † Corresponding author.

**Abstract:** Road network in Indonesia, which consists of 446,000 km of national, provincial and local roads as well as toll highways, are exposed to various natural hazards, such as earthquakes, floods, landslides, volcanic eruptions etc. Within the Indonesian archipelago, which consists of more than 13,000 islands, several global tectonic plates interact, such as the Indo-Australian, Pacific, Eurasian as well as the Philippines plates, resulting in a complex geological setting, characterized by the existence of seismically active faults and subduction zones and a chain of more than one hundred active volcanoes. Heavy monsoon rainfalls trigger floods, flash floods, debris and lahar flows and landslides, which often damage roads and bridges. Losses due to disasters caused by the damage of road infrastructures as well as socio-economic losses due to traffic disruption are compromising the development of the country. Risk reduction measures are essential to the sustainability of the road network, a vital infrastructure to the socio-economic activities of the country. As resources are limited, priorities need to be identified in implementing risk reduction measures to the road infrastructure. A research is conducted on the earthquake risk model for roads in the country. The objective of the research is to develop an earthquake disaster risk assessment model for road links, in terms of road segments. Assessing disaster risk is essential in order to provide adequate information for decision makers at the national and local level in prioritizing disaster mitigation works for road segments. The model is based on the development of a road disaster risk index model involving a series of risk indicators. Based on the earthquake risk index model, the risk level of each road segments within a road network can be assessed and then plotted into the road network map based on the risk level category. It is expected that with the risk assessment model, road management programs will be able to better prioritize risk mitigation measures and hence improving the network level of service. The research compares various risk assessment models that have been developed in other countries, and identifies potential indicators to be adapted in the road risk index model. The road earthquake risk index model is structured based on the definition of disaster risk factors and their components, and the indicators are selected to reflect the value of each risk factors. By aggregating those values, weighted in accordance to the importance of the factors, a risk index value for a specific road link can be established, as an indicator of its relative risk level to the other road links in the road network system.

**Keywords:** risk assessment, earthquake, model, road link

ESDP 3-D6



## ON THE IMPORTANCE OF GPS SEA FLOOR DEFORMATION FOR DISASTER RISK REDUCTION IN JAVA, INDONESIA

N. Rahma Hanifa<sup>1,\*†</sup>, Endra Gunawan<sup>2</sup>, Irwan Meilano<sup>4</sup>, and Udrekhan Hanif<sup>3,1</sup> Research Center for Disaster  
Mitigation, Institute Technology Bandung

<sup>2</sup>Graduate Research on Earthquake and Active Tectonic, Institute Technology Bandung

<sup>3</sup>Geodesy Engineering Department, Institute Technology Bandung

<sup>4</sup>The Agency for the Assessment and Application of Technology (BPPT)

E-mail: <sup>1</sup>rahma.endra@gmail.com

<sup>\*</sup>Presenter; <sup>†</sup> Corresponding author.

**Abstract:** Subduction zones are places where devastating megathrust earthquakes occurred, accompanied by large tsunamis, such as the 2004 M9.3 Sumatra-Andaman earthquake in Indonesia and the 2011 M9.0 Tohoku earthquake in Japan. Beneath Java Island, the most populated island in Indonesia, the Australia plate subducts beneath Sunda Block along the Java trench off Java Island. Despite its aseismic activity, in term that no megathrust earthquakes with  $M > 8.0$  occurred in the last 300 years, recent study using continuous GPS data indicate that the accumulated seismic moment in the subduction plate interface is capable to host a  $\sim M_w 8.7$  off southwest Java (Hanifa, et al., 2014). That study use only land GPS observation, which is 200 km from the trench, yet their model suggests a possibility of full coupling condition in the shallowest part of the trench. Occurrence of past tsunami earthquakes along the Java Trench imply capability of this subduction zone to allow rupture to the most shallow part of the trench, which may give a threat for either future tsunami earthquake or tsunami genic earthquake. In order to evaluate a more accurate estimation of state of interplate coupling near the trench, seafloor geodetic data technology has proved it capability to estimate a more reliable state of interplate coupling (e.g. Inuma et. al., 2015). In this paper, we show the importance to conduct a GPS seafloor deformation measurement in the shallow portion of the subduction near the Java Trench, for disaster risk reduction purpose. The methodology will employ a numerical simulation using checkerboard test to evaluate the reliability of the spatial resolution of the analysis. Geodetic data consist of combination of existing continuous GPS network in Western Java and proposed location to install geodetic seafloor.

**Keywords:** deformation model, interplate coupling,  
megathrust earthquakes, tsunami earthquakes

ESDP 3-D7





## DEVELOPMENT OF COLLABORATIVE MODEL IN EARTHQUAKE DISASTER RISK ANALYSIS AT COMMUNITY LEVEL

Aria Mariany\*†

Doctoral Programme of City and Regional Planning Institut Teknologi Bandung

E-mail : ariamariany@gmail.com

\* Presenter; † Corresponding author.

**Abstract:** Disaster risk assessment is conducted to assess the risk level in one area. It can be used for planning issue as well as for determining the disaster mitigation effort in such area. There are many researches that have developed the disaster risk analysis methods, both top-down and bottom-up approach. At certain level of planning, the top-down approach can be used, but at community level, it can produce different risk acceptance between what researcher has resulted and what community accept. Therefore, community involvement in the disaster risk assessment is important to produce consensus on risk level in the area. This research is aimed at identifying the participation form in disaster risk assessment at community level, developing collaborative model in disaster risk analysis and the involvement of stakeholders, and identifying factor that influence the collaborative model in disaster risk analysis at community level. This research will contribute in supporting and enrich the collaborative planning theory, especially in disaster risk analysis and will also contribute to the new participatory approach in disaster risk analysis especially in the less disaster experienced area to produce the consensus in disaster risk at community level.

**Keywords:** disaster risk analysis methods, disaster risk assessment

ESDP 3-D8

## APPLICATION OF CONTINGENT VALUATION METHOD IN SANITATION QUALITY IMPROVEMENT EFFORTS AT CIKAPUNDUNG RIVERS IN BANDUNG CITY

Luthfan Jatnika<sup>1</sup> and Benno Rahardyan<sup>2</sup>

<sup>1</sup>Graduate Program Environmental Engineering,

<sup>1,2</sup>Faculty of Civil and Environmental Engineering, <sup>1,2</sup>Institut Teknologi Bandung,

Email: <sup>1</sup>luthfan.jatnika@gmail.com, <sup>2</sup>benno@ftsl.itb.ac.id

**Abstract :** Currently experiencing a sub-watershed Cikapundung waste pollution is very high. To remedy the situation must involve people's desire to keep their environment to keep them clean. Public interest can we know the contingent valuation method (CVM). The research was conducted in October 2012 to November 2012 in Bandung City. Every week Sub-watershed Cikapundung produce 3018.4 m<sup>3</sup>, while polling stations in the area to accommodate the sub-watershed Cikapundung only 22 Solid Waste Management Facility (TPS) with a total capacity of 2768.4 m<sup>3</sup>/weeks thus remaining 9.03% or 250 m<sup>3</sup>/weeks (1000 m<sup>3</sup>/month), TPS incoming junk that could potentially contaminate the river entrance Cikapundung. The study says the 56.7% (208 respondents) still throw garbage into the river, there is a 567 m<sup>3</sup>/month the incoming stream. If we assume all the waste has entered the stream processing cost of Rp 119,550,45.-. If added to the waste to Rp 1,092,452,979.-. In fact CVM shows the total cost willingly donated by people in Sub-watershed Cikapundung Rp 527,905,500. -. With the availability of such costs, the government still had to Rp 564,547,479. - to be able to cover the shortfall in the cost of waste management sub-watershed Cikapundung. In addition, 97% of the public favor a counseling program so that people do not throw garbage into the river, and is estimated to cost Rp 335,195,000.- per month. Total government had set aside Rp 899,742,479.- every month to improve waste management systems and community mental Cikapundung Rivers Bank.

**Keywords:** waste pollution, desire society, contingent valuation method

ESDP 3-P1



## CONTENT OF HEAVY METALS IN THE WATER AND WATER HYACINTH (*Eichhornia crassipes*) IN WATER BODIES RECEIVING WASTEWATER FROM TEXTILE INDUSTRY (Case study: Cikacembang River, Majalaya Districts, Bandung Regency)

Fathunnisa<sup>1\*</sup> and Indah Rachmatiah Siti Salami<sup>2†</sup>

Master Programme of Environmental Engineering

Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung Ganesha 10 Bandung 40132

Email: fathunnisa@gmail.com<sup>1</sup> and indahrss@ftsl.itb.ac.id<sup>2</sup>

\* Presenter; † Corresponding author.

**Abstract:** Cikacembang River is including the worst water quality, from a total of 56 industries in the District Majalaya, 22 textile industry throw waste into the Cikacembang River with an average daily discharge 66,058 m<sup>3</sup>/day (BPLHD Bandung regency, 2012). Effluents from textile industry contains high amounts of metal, especially cadmium, chromium, copper, and lead that are harmful to living things. Utilization of aquatic plants for wastewater treatment is an economical method of wastewater treatment contaminated by heavy metals. Therefore, to reduce the content of heavy metal in the Cikacembang River, it is done phytoremediation by using the water hyacinth (*Eichhornia crassipes*) with two different methods, namely continuous system (field) and continuous system (laboratory). The content of heavy metals Cd, Cr, Cu, and Pb in the water and the water hyacinth (*Eichhornia crassipes*) were measured using Inductively Coupled Plasma Optical Emission Spectrometry (ICP-OES). The result showed that the metal content in the water and the water hyacinth (*Eichhornia crassipes*) in batch and continuous systems is different, the effectiveness of the water hyacinth plant (*Eichhornia crassipes*) to absorb metal in a batch system is better than continuous system because the batch system can reduce Cd metal, Cr, Cu, and Pb respectively 1.19%, 57.95%, 88.18%, and 0.29%. In the continuous system, the water hyacinth plant (*Eichhornia crassipes*) can only reduce about Cd 74.68% and Cu 46.41%, while Pb and Cr increased -138.69% and -28.90%.

**Keywords:** Cikacembang river, phytoremediation, water hyacinth (*Eichhornia crassipes*), batch system, continuous system

ESDP 3-P2



## NITRIFICATION KINETICS IN AQUACULTURE WASTEWATER TREATMENT USING BATCH REACTOR

Aini Zahra<sup>1</sup> and Marisa Handajani<sup>2</sup>

Master Programme of Environmental Engineering

Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung Jl. Ganesha 10 Bandung 40132

Email: <sup>1</sup>aini.zahra007@gmail.com and <sup>2</sup>m\_handajani@yahoo.com

**Abstract:** Accumulation of aquaculture wastewater in pond that contains ammonium can disturb the metabolism of the body and cause death in freshwater prawns. Therefore, ammonium should be removed through nitrification on the suspended growth bioreactor such as batch reactor. The objective of this study was to evaluate the removal efficiencies of ammonium, to determine kinetics of biomass growth, and to determine nitrification rate through kinetic constant and reaction order. Five laboratory scale batch reactor with working volume of each reactor 12.5 L were fed with synthetic wastewater that already contains mixed culture bacteria. This research was carried out with different ammonia nitrogen concentration: 1, 2, 3, 4 and 5 mg NH<sub>3</sub>-N/l. The parameter observed during the process were temperature, pH, DO (Dissolved Oxygen), COD (Chemical Oxygen Demand), VSS (Volatile Suspended Solids), TAN (Total Ammonia Nitrogen), nitrite, and nitrate. The results showed that ammonia nitrogen removal only occurred on the first four days of operation reactor with the greatest removal efficiency in R2 (2 mgNH<sub>3</sub>-N/l) was about 25.74%. Nitrite accumulation did not occur during reactor operation. In addition, from this research obtained  $\mu_m$  was 0.038 day<sup>-1</sup> and K<sub>s</sub> was 0.189 mg/l.

**Keywords:** aquaculture wastewater, ammonium, nitrification, batch reactor, kinetics

ESDP 3-P3



## MODIFICATION OF TRIPIKON-S WITH BIOBALL ADDITION IN ARTIFICIAL BLACK WATER TREATMENT FOR SWAMP AND COASTAL AREAS

Dewi Fitria Marlisa<sup>1</sup>, Dyah Wulandari Putri<sup>2</sup>, and Prayatni Soewondo<sup>3</sup>

Master Programme of Environmental Engineering, Institut Teknologi Bandung

E-mail: <sup>1</sup>dewifitriamarlisa@gmail.com, <sup>2</sup>dyah.wulan059@gmail.com, and <sup>3</sup>prayatnisoe@yahoo.com

**Abstract:** Tripikon-S can be used as a septic tank or pit latrine households to areas of shallow groundwater, tidal areas and swamps, or on small plots of land area. Construction Tripikon-S consists of three concentric pipes with the working principles of the treatment process is similar to a conventional septic tank. This study is intended to treat black water on batch and continuous systems with tripikon-S reactor volume of 18 liters. The reactor used in the research are original Tripikon-S reactor (Tripikon-S Control) and Tripikon-S with the bioball addition (Tripikon bioball). Black water used is black water artificial. Organic load variation is 1500 mg COD/ l and 2000 mgCOD / l. The parameters analyzed were pH, DO, temperature, COD, total nitrogen (NTK) and total phosphate. In a batch system average COD removal efficiency in the reactor Tripikon-S and Tripikon-S bioball is 44.31% and 49,81%. In the continuous system with a residence time of 48 hours and a variety of organic load in 2000 is able to provide the best results in COD, NTK and total phosphate. COD removal efficiency, NTK and total phosphate in the reactor Tripikon-S was 63.04%, 25.20% and 26.53%. While Tripikon-S reactor bio-ball COD removal efficiency, NTK and total phosphate was 75.93%, 25.02% and 35.39%.

**Keywords:** blackwater, tripikon-s, bioball, septic tank

ESDP 3-P4

## INFLUENCED FACTORS OF STRUCTURE FOR WASTEWATER TREATMENT SYSTEM IN CHALLENGING AREA,(CASE STUDY : PALEMBANG CITY, SOUTH SUMATERA PROVINCE, INDONESIA)

Dian P. Apriadi<sup>1</sup>, Dyah Wulandari Putri<sup>2</sup>, and Prayatni Soewondo<sup>3</sup>

Master Programme of Environmental Engineering, Institut Teknologi Bandung Jl. Ganesha 10 Bandung 40132

E-mail: <sup>1</sup>Dian.apriadi@student.itb.ac.id, <sup>2</sup>dyah.wulan059@gmail.com, and <sup>3</sup>prayatnisoe@yahoo.com

**Abstract:** Provision of sanitation system in coastal settlement is a significant problem in Indonesia. Palembang is one of the low land which influenced by the Musi river. A quarter percentages from 1.4 million of population has live either in tidal condition or above the river. This condition was caused various problems in wastewater treatment system application determination. From Information, study literature, and survey, the dominant facilities which had built were still less efficient and ineconomical, and potentially harmful to the environment as well. Therefore, design modification was needed in order to develop the wastewater domestic management facilities. (1) the effect of soil properties indicates that soil is high of water saturated and clay. Using Plaxis 8.2 2D finite element analysis, it shows the reason of crack for the structure. (2) Tidal wave, which indicated the high and low points, 1.6 m and 1.1. m respectively lead the difference between waterlogged and dry condition. It causes the problem of fiberglass floatation. (3) Water quality describes that marsh condition which had experience of aerobic and anaerobic reaction can cause the corrosion of material. From the simulation shows that crack cause because the deformation mesh values is higher than safety factor, which is  $25.24 \cdot 10^3$  m higher than 0.016 m. the reduction of the values cause the collapse of the building.

**Keywords:** Domestic wastewater treatment: specific area: deformation

ESDP 3-P5



## THE REMOVAL OF ORGANIC SUBSTANCE USING THE MODIFIED TRIPIKON S FOR THE USAGE IN COASTAL AND THE SWAMP AREAS

Dian Ardina Kusumaningayu<sup>1</sup>, Dyah Wulandari Putri<sup>2</sup>, and Prayatni Soewondo<sup>3</sup>

Master Programme of Environmental Engineering Institut Teknologi Bandung

Ganesha Road No.10 Bandung 40132

Email: <sup>1</sup>dianardinak27@gmail.com, <sup>2</sup>dyah.wulan059@gmail.com, and <sup>3</sup>prayatnisoe@yahoo.com

**Abstract:** Sanitation facilities which can be used in reliable and sustainable ways for specific areas must be helpful to improve health condition and environmental quality. Tripikon-S is a vertical septic tank (cesspool) with three pipes used concentrically. However, this tank still has weaknesses. This current research, therefore, attempts to modify Tripikon-S by adding venture pipes and some baffle pipes to facilitate the occurrence of anaerobic-aerobic processes in Tripikon-S. An experiment is conducted over the influence on COD of various influent concentrations of 1500 mg/L and 2000 mg/L and also that of various hydraulic retention times (HRT) of 24 hours, 36 hours and 48 hours. The measured parameters include pH, temperature, Dissolved Oxygen (DO), Chemical Oxygen Demand (COD), Volatile Suspended Solid (VSS), Nitrogen Total Kjeldahl (NTK), and Total Phosphate (TP). Result of experiment of continuous efficiency organic substance for the highest reactor control is 63,04% achieved on influent variation concentrate 2000 mg/l COD and HRT. Meanwhile, the highest elimination for venture reactor is 67,39% achieved same variation with control reactor.

**Keywords:** black water waste, tripikon-S, batch system, continuous

ESDP 3-P6

## MATERIAL FLOW ANALYSIS OF VEGETABLES WASTE CAUSED BY HORTICULTURAL ACTIVITY (CASE STUDY: BANDUNG CITY)

Faruq Nejaridwana<sup>1</sup>, Tri Padmi<sup>2</sup>, and Benno Rahardyan<sup>3</sup>

Master Program in Environmental Engineering

Faculty of Civil Engineering and Environment, Institut Teknologi Bandung Jalan Ganesha 10 Bandung 40132

E-mail: <sup>1</sup>faruqnejaridwana@gmail.com, <sup>2</sup>tripadmi@fts.itb.ac.id, <sup>3</sup>benno.rahardyan@gmail.com

**Abstract:** Material Flow Analysis was used to assess the amounts of vegetables that introduced into Bandung City and become wastes in every transaction chain; grower, supplier, wholesale market, retail, consumer and finally collected into final disposal. A huge amount that produced by the peeling processes raised an idea from Mayor of Bandung to apply a policy “peeled vegetables” before introduced into Bandung City. Boundary of the mass flow in this study is Bandung City and functional unit used is a unit of weight (tons). Input data used in this research is the data amount of vegetables that go into Bandung City which is calculated based on the level of consumption of vegetables per capita population of Indonesia, adjusted for the population of Bandung City and the number of people around Bandung City who obtained the distribution of vegetable wholesale market in Bandung. Percentage of waste generated in each transaction chain obtained by observation and experiment in the field, the experiment are artificially at the household level and interviews with actor’s distribution. The resulting output is the number of vegetables waste in every transaction chain vegetables in Bandung City, either through modern markets and traditional markets. From the analysis it can be seen that the amount of vegetables waste in Bandung is 1,252.38 tons / week or 9.54% of 13,126.02 tons of waste generated in Bandung City each week.

**Keywords:** material flow analysis, waste, vegetables, postharvest losses

ESDP 3-P7



## THE DEVELOPMENT OF ENVIRONMENTALLY FRIENDLY PAVEMENT USING TITANIUM DIOXIDE (TiO<sub>2</sub>) FOR REDUCTION OF NITROGEN OXIDES (NO<sub>x</sub>) GAS

I Made Bayu<sup>1</sup>, Kania Dewi<sup>2</sup>, and Moh. Irsyad<sup>3</sup>

Master Program of Environmental Engineering

Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung, Ganesha 10<sup>th</sup> Street Bandung 40132

Email: <sup>1</sup>imadebayu@yahoo.co.id, <sup>2</sup>kaniadewi\_itb@yahoo.com, <sup>3</sup>mohirsyad@tl.ac.idl.itb.ac.id

**Abstract:** Motor vehicle emissions such as nitrogen oxides (NO<sub>x</sub>) include nitric oxide (NO) and nitrogen dioxide (NO<sub>2</sub>) are important air pollutants, because it's have significant harm to human health and play an important role of being precursor of another dangerous pollutants such as formation of photochemical smog. The photocatalytic process using ultraviolet (UV) light and semiconductor particles is a promising alternative of NO<sub>x</sub> abatement. In fact, treatment of pollutants related to environmental problems through photo assisted catalyst has been a much discussed topic in today's literatures, since efficient utilization of solar light for various emission control processes can save the consumption of fossil fuels. Pavement coated titanium dioxide (TiO<sub>2</sub>) anatase with content pure of 98.82% at 0.02 g/cm<sup>2</sup> in the photo reactor which flowed NO<sub>x</sub> at concentration of 0.327 ppm-0.680 ppm exposed to UV light intensity from 47.9 to 59.0 μW/cm<sup>2</sup> within 6 hours, 12 hours, 18 hours and 24 hours. Nitrate ion and nitrite ion are formed by the photocatalytic pavement surface which is diluted with distilled water then measured by ion chromatography. Nitrate and nitrite ions are formed by the photocatalytic paving surface which is diluted with distilled water then measured by ion chromatography. The optimal efficiency of NO<sub>x</sub> removal in this research was 45% which occurred at 18 hours of exposure at 68% -74% humidity. While the resulting of adsorption rate was ranged at 10.932 mg/m<sup>2</sup>/day - 19.398 mg/m<sup>2</sup>/day, increasing the concentration of NO<sub>3</sub><sup>-</sup> in line with the duration of exposure.

**Keywords:** nitrogen oxides (NO<sub>x</sub>), pavement, titanium dioxide (TiO<sub>2</sub>), nitrate ion, nitrite ion.

ESDP 3-P8



## ANALYTIC HIERARCHY PROCESS FOR THE EVALUATION OF TRANSPORT POLICIES IN BANDUNG CITY

Ferry Irawan Kartasasmita<sup>1\*</sup>, Asep Sofyan<sup>2†</sup>, Bona Frazila<sup>3†</sup>, dan I Made Bayu<sup>4†</sup>

Master Programme of Environmental Engineering

Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung Jl Ganesha 10 Bandung 40132

Email: ferryirawank@gmail.com<sup>1</sup>, asepssofyan@gmail.com<sup>2</sup>, frazila@yahoo.com<sup>3</sup>, imadebayuitb@gmail.com<sup>4</sup>

\* Presenter; † Corresponding author.

**Abstract:** Increased of amounts vehicles in every year can be problems toward transportation governance of Bandung city. The congestion and increased air pollution into special consideration determining the direction of transportation policy in this city. Hence the need for a study that aims to fill these knowledge gaps in the transport sector. This research will be involved with the environment, transportation and other policies relevant to assessing transportation options with multiple criteria such as afford ability, implement ability, transport quality and quantity of services and environmental sustainability as well. The Analytic Hierarchy Process (AHP) is a method of measurement for formulating and analyzing decisions. It is decision tool support which can be used to solved complex decision problems into account tangible and intangible aspects. In this research uses data was collected through a questionnaire which was divided into four stakeholders, namely; Government, academia, private sector workers and the local community. AHP provides convenience in determining priority criteria for the transportation plan. The result of this research showed that the most of respondents consists of local government, academia, private sector workers, and the local community perceive that sustainable of environmental is a major priority in terms of the criteria determining the transportation plan with a percentage of 28.87%. The quality of transportation services, affordability economically, ease to be implemented and the quantity of transport service were in the range of 21,78% ; 20,17% ; 19,77 % ; 9,39 %, respectively.

**Keywords:** AHP, criteria, policy, questionnaires, transportation

ESDP 3-P9



## 3rd ESDP 2015

### *Author Index*

<b>Authors</b>	<b>Affiliation</b>	<b>Paper Code</b>
Abidin, H.Z.	Geodesy Research Group, Faculty of Earth Science and Technology, Institut Teknologi Bandung	D4
Apriandi, D.P.	Master Program of Environmental Engineering, Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung	P5
Bayu, I M.	Master Program of Environmental Engineering, Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung	P8,P9
Chasanah, N.	Master Program of Environmental Engineering, Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung	E12
Cummins, Phil.	RSES Australian National University, Canberra, Australia	D4
Damanhuri, E.	Environmental Engineering, Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung	E11
Dewi, K.	Environmental Engineering, Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung	E15, P8
Erwana, F.	Master Program of Environmental Engineering, Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung	E15
Fathunnisa	Master Program of Environmental Engineering, Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung	P2
Faza, M.F.	Master Program of Environmental Engineering, Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung	E12
Frazila, R.B.	Environmental Engineering Department, Institut Teknologi Bandung	E2, P9
Fujita, S.	National Institute of Technology, Gifu College, Japan	E4
Gunawan, E.	Graduate Research on Earthquake and Active Tectonic, Institut Teknologi Bandung	D7
Habuchi, H.	National Institute of Technology, Gifu College, Japan	E4





**The Third Joint Seminar of Japan and Indonesia Environmental Sustainability and Disaster Prevention (3<sup>rd</sup> ESDP-2015)**

Bandung Institut Teknologi, Indonesia – November 25<sup>th</sup>, 2015

Hadinata, F.	Doctoral Program of Environmental Management Technology, Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung	E11
Handajani, M.	Environmental Engineering, Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung	E14, P3
Hanifa, N.H.	Research Center for Disaster Mitigation, Institut Teknologi Bandung	D7
Hendri	Universitas Papua, Indonesia	E3
Irsyad, M.	Environmental Engineering, Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung	P8, D4
Jatnika, L.	Graduate Program Environmental Engineering, Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung	P1
Kartasmita, F.I.	Master Program of Environmental Engineering, Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung	P9
Kitada, T.	National Institute of Technology, Gifu College, Japan	E1, E6
Kobayashi, S.	Research Center for Industrial Culture, The Institute of Advanced Media Arts and Sciences	D3
Koulali, Achraf.	RSES Australian National University, Canberra, Australia	D4
Kubota, K.	Japan Freight Railway Company, Japan	D2
Kunaefi, T.D.	Environmental Engineering, Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung	E14
Kuntoro, A.A.	Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung	E3
Kusumaningayu, D.A.	Master Program of Environmental Engineering, Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung	P6
Lestari, P.	Environmental Engineering, Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung	E5
Mariany, A	Doctoral Program of City and Regional Planning, Institut Teknologi Bandung	D8
Marlisa, D.F.	Master Program of Environmental Engineering, Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung	P4



**The Third Joint Seminar of Japan and Indonesia Environmental Sustainability and Disaster Prevention (3<sup>rd</sup> ESDP-2015)**

Bandung Institut Teknologi, Indonesia – November 25<sup>th</sup>, 2015

Meilano, I.	Geodesy Research Group, Faculty of Earth Science and Technology, Institut Teknologi Bandung	D4, D7
Mulyasari, F.	Research Center for Disaster Mitigation, Institut Teknologi Bandung	D5
Muntalif, B.S.	Environmental Engineering, Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung	E12
Nakamura, S.	Media Creations Research department, The Institute of Advanced Media Arts and Sciences,	D3
Nastiti, A.	Doctoral Program of Environmental Management Technology, Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung	E13
Nejaridwana, F.	Master Program of Environmental Engineering, Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung	P7
Novitasari, Y.	Graduate Program Environmental Engineering, Faculty of Civil and Environmental Engineering, Intsitut Teknologi Bandung	E10
Ota, Y.	Research Center, Nishi-Nippon Institute of Technology, Fukuoka, Japan	E7
Padmi, T.	Environmental Engineering Department, Institut Teknologi Bandung	E8,P7
Prajati, G.	Master Program of Environmental Engineering, Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung	E8
Pribadi, K. S.	Department of Civil Engineering, Institut Teknologi Bandung	D6
Putri, D.W.	Master Program of Environmental Engineering, Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung	P4, P5, P6
Qonitan, F.D.	Master Program of Environmental Engineering, Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung	E5
Rahardyan, B.	Environmental Engineering, Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung	E8, E11, E15, P1, P7
Sakamoto, J.	National Institute of Technology, Gifu College, Japan	D2
Salami, I.R.S.	Environmental Engineering, Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung	P2
Sato, T.	TriggerDevice Co.,Ltd	D3



**The Third Joint Seminar of Japan and Indonesia Environmental Sustainability and Disaster Prevention (3<sup>rd</sup> ESDP-2015)**

Bandung Institut Teknologi, Indonesia – November 25<sup>th</sup>, 2015

Sembiring, E.	Environmental Engineering, Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung	E10
Sengara, I.W.	Department of Civil Engineering, Institut Teknologi Bandung	D6
Shimizu, T.	Department of Architecture, National Institute of Technology, Gifu College, Japan	D1
Shimohara, T.	Kyushu University, Fukuoka, Japan	E6
Siami, L.	Environmental Engineering Department, Institut Teknologi Bandung	E2
Soewondo, P.	Environmental Engineering, Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung	E14, P4, P5, P6
Sofyan, A.	Environmental Engineering, Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung	E2, P9
Sofyan, I.	Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung	E14
Sudjono, P.	Environmental Engineering, Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung	E9
Susilo.	Agency for Geospatial Information (BIG), Indonesia	D4
Tajima, K.	Department of Electrical and Computer Engineering, National Institute of Technology Gifu college, Japan	D3
Takikawa, H.	Toyohashi University of Technology, Japan	E4
Tomo, H.S.	Environmental Engineering, Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung	E5
Toyfur, M. F.	Department of Civil Engineering, Institut Teknologi Bandung	D6
Udrekhanif	The Agency for the Assessment and Application of Technology (BPPT)	D7
Wada, K.	Department of Civil Engineering, National Institute of Technology, Gifu College, Japan	E7
Wahyu, A.	Ministry of Environment and Forestry of Indonesia	E3
Wibowo, S.S.	Department of Civil Engineering, Institut Teknologi Bandung	D6
Widyanggita, A.C.	Master Program of Environmental Engineering, Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung	E9



**The Third Joint Seminar of Japan and Indonesia Environmental Sustainability and Disaster Prevention (3<sup>rd</sup> ESDP-2015)**

Bandung Institut Teknologi, Indonesia – November 25<sup>th</sup>, 2015

Yada, S.	Central Japan Railway Company, Japan	D2
Yoshikawa, M.	Osaka Gas co., ltd., Japan	E6
Zahra, A.	Master Program of Environmental Engineering, Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung	P3



## 3rd ESDP 2015

### *Keyword Index*

activated carbon fibers	E6
AHP	P9
Air pollution	E1, E6
ammonium	P3
aquaculture wastewater	P3
batch reactor	P3
batch system	P2, P6
Bicycle Touring	D3
bioball	P4
biodegradable plastics	E10
black water waste	P6
blackwater	P4
Borneo	E3
busway corridor 13 <sup>th</sup>	E2
carbon emission	E3
Cikacembang river	P2
Citarum upstream	E12
climate change adaptation	D5
cloud resolving/non-resolving	E1
cluster analysis	E8
community	E14
contingent valuation method	P1
continuous	P6
continuous system	P2
correlation	E12
countermeasures against disaster	D1
criteria	P9
deformation	P5
Deformation Model	D4, D7
degradability	E10
degradable plastics	E10
desire society	P1
DGVM	E3
disaster risk analysis methods	D8

disaster risk assessment	D8
disaster risk reduction	D5
Domestic wastewater treatment	P5
earthquake	D6
economy activity	E8
emission inventory	E2
filter	E5
fine particulate,	E5
fishway design	E7
forest fire	E3
government	E14
graphitic carbon nitride	E4
habitat	E7
iBeacon	D3
impactor	E5
Indonesia	D4
infiltration	E11
interplate coupling,	D7
joint credit mechanism (JCM)	E9
kinetics	P3
landfill	E11
leachate	E11
linear programming	E9
liquid media	E10
load emission	E2
Location information infrastructure	D3
macrozoobenthos population density	E12
mass media	D2
material flow analysis	P7
MDGs	E13
megathrust earthquakes,	D7
micro porous	E6
model	D6
model test	E8
nephelometer,	E5
nitrate ion	P8
nitrification	P3
nitrite ion	P8



**The Third Joint Seminar of Japan and Indonesia Environmental Sustainability and Disaster Prevention (3<sup>rd</sup> ESDP-2015)**

Bandung Institut Teknologi, Indonesia – November 25<sup>th</sup>, 2015

nitrogen oxides (NOx)	P8
nox	E6
optical absorption spectra	E4
optimization	E9
organic waste	E9
past disaster records	D1
path analysis	E15
pavement	P8
photocurrent	E4
photosensitivity	E4
physical characteristics	E11
phytoremediation	P2
pipe-type fishway	E7
policy	P9
postharvest losses	P7
questionnaires	P9
railway	D2
reliability	E15
resilience	D5
risk assessment	D6
risk communication	D5
road link	D6
road networking model	E2
roadside	E6
sanitation	E14
SDGs	E13
Seismic Hazard	D4
septic tank	P4

siphon migration	E7
slum area	E14
social networking service	D2
soil	E11
solid media	E10
specific area	P5
sustainable water supply	E13
text mining	D2
the noubi earthquake	D1
titanium dioxide (TiO <sub>2</sub> )	P8
traditional architecture	D1
transport modeling	E1
transportation	P9
tripikon-S	P6, P4
tsunami earthquakes	D7
Unconventional tin mining	E15
urban,	E5
validity	E15
vegetables	P7
waste	P7
waste generation	E8
waste pollution	P1
water hyacinth (Eichhornia crassipes)	P2
water quality	E12
Water supply policy	E13
wet deposition	E1



**VENUE LOCATION:**

ALSI Building 2<sup>nd</sup> Floor Ganesha Street No. 10 Bandung

