# The 4<sup>th</sup>-International Workshop on MULTIMODAL SEDIMENT DISASTER

## "Disaster Mitigation through Partnership-Based Knowledge Sharing"





September 8-9, 2013

### The 4<sup>th</sup> International Workshop on

## MULTIMODAL SEDIMENT DISASTER

"Disaster Mitigation through Partnership-Based Knowledge Sharing"

Editors
Djoko Legono
Teuku Faisal Fathani
Rachmad Jayadi
Jazaul Ikhsan
Puji Harsanto
Muhammad Sulaiman

Organized by

Civil and Environmental Engineering Department, Faculty of Engineering, Universitas Gadjah Mada, Indonesia

Co-organized by

Research Center for Fluvial and Coastal Disaster, Disaster Prevention Research Institute, Kyoto University, Japan Graduate School of Life and Environmental Sciences, University of Tsukuba, Japan Disaster Prevention Research Center, National Cheng Kung University, Taiwan

In Cooperation with

MSD-Network Indonesia, MSD-Network Japan, MSD-Network Taiwan

September 8-9, 2013 Yogyakarta, Indonesia

#### Editors

Djoko Legono Teuku Faisal Fathani Rachmad Jayadi Jazaul Ikhsan Puji Harsanto Muhammad Sulaiman



Civil and Environmental Engineering Department, Faculty of Engineering, Universitas Gadjah Mada



Research Center for Fluvial and Coastal Disaster, Disaster Prevention Research Institute, Kyoto University







Proudly co-organize

The 4<sup>th</sup> International Workshop on Multimodal Sediment Disaster (4th-IWMSD) Disaster Mitigation Through Partnership-Based Knowledge Sharing

Published by
Department of Civil and Environmental Engineering
Faculty of Engineering, Universitas Gadjah Mada
Jalan Grafika No. 2, Yogyakarta 55281, INDONESIA

Tel: +62-274-545675 Fax: +62-274-545676

Website: http://msd2013.cee-ugm.com/

E-mail: msd2013@cee-ugm.com

ISBN: 978-602-95687-8-3

The texts of the papers in this volume were set individually by the authors or under their supervision. Only minor corrections to the text may have been carried out by the publisher. By submitting the paper in the The 4<sup>th</sup> International Workshop on Multimodal Sediment Disaster (4th-IWMSD)-Disaster Mitigation Through Partnership-Based Knowledge Sharing, the authors agree that they are fully responsible to obtain all the written permission to reproduce figures, tables and text from copyrighted material. The authors are also fully responsible to give sufficient credit included in the figures, legends or tables. The organizer of the workshop, reviewers of the papers, editors and the publisher of the proceedings are not responsible for any copyright infringements and the damage they may cause.

## LIST OF PAPERS

#### PREFACE

#### LIST OF PAPERS

1.	Formulas  Wan Hanna Melini WAN MOHTAR, JUNAIDI and Muhammad MUKHLISIN	. 1
2.	Morphological Changes of Riverbed Induced by Channel's Cross Section and Discharge Variation  Endro P. WAHONO, Djoko LEGONO, ISTIARTO, Bambang YULISTIYANTO and Gerrit J. KLAASSEN	. 7
3.	A Practical Idea for Disaster Prevention in the Areas around Active Volcanoes such as Mt. Merapi, Yogyakarta, Indonesia - A Preliminary Research	13
4.	Hydrological Characteristic and Simulation of the Jakarta 2013 Flood, Indonesia	19
5.	Debris Force on Rectangular Column due to Tsunami	25
6.	Simulation of Sediment Runoff Following Landslides	31
7.	Slope Management Survey using SMART Method at Precint 20 Putrajaya Malaysia Muhammad MUKHLISIN, Nur Syahira ZAINAL and Wan Hanna Melini Wan MOKHTAR	37
8.	The Investigation of Sediment Accumulation and Its Distribution over Sentani Lake, Jayapura Yusuf BUNGKANG and SOEMARNO	45
9.	Study on Surge Triggered by Debris flow Plunging into River	51
10.	Prediction of Lahar Triggered by Snowmelt using Numerical Simulations Involving Snowmelt and Drainage Processes  Shusuke MIYATA, Daizo TSUTSUMI, Keiki MURASHIGE and Masaharu FUJITA	57
11.	Lift up Force on Concrete Blocks due to Tsunami Nurul AZIZAH, Radianta TRIATMADJA, KUSWANDI	65
12.	EFDC Three Dimensional Model Assumption for Sediment Deposition in Wonogiri Reservoir	71
13.	Community-based Approach on Flood Disaster Risk Reduction	77
14.	Time-prediction Method of Upset of Landslides based on the Stress-dilatancy Relation for Early Warning against Shallow Landslides	83

15.	Community Based Disaster Risk Reduction: Jember Debris Flow Experiences M. Farid MA'RUF and Evita S. HANI	. 91
16.	Community Awareness and Attitudes to Urban Floods: Findings from Questionnaire Survey of Flooding and Non-Flooding Areas in East Java, Indonesia	. 97
17.	Influence of the Correction Factors in Simulating Debris Flows Yih-Chin TAI and Chia-Chi SHEN	103
18.	Bridges Condition in the Rivers of Boyong-Code, Kuning and Gendol in the Post 2010 Merapi Eruption  Iman SATYARNO, Andreas TRIWIYONO, Ali AKBAR, Mega A. WIDIASTUTI and Ulil M. MUSAKKIR	109
19.	Influence of Past Landslides and Resulting Sedimentation in a Sediment Disaster at Hsiaolin Village, Taiwan, during Typhoon Morakot, 2009	117
20.	Progress on Numerical Model Development of 1D Debris Flow using Lagrangian Galerkin Method	125
21.	Effect of Debris Flows Post the 2010 Eruption of Mount Merapi on Environment and Socio-Economic Condition In Progo River and Its Tributaries	133
22.	Experimental Study of Pore Water Pressure in Multi-layer Soil Structure	141
23.	Debris Flow and Flash Flood at Putih River after the 2010 Eruption of Mt. Merapi, Indonesia	147
	An Evaluation of River Bank Erosion in Volcanic Rivers Post Eruption 2010 of Mount Merapi	153
	Tools of Prediction of Lahar Occurrence after Volcanic Eruption	161

Tibs p

sample (D), is and D each to also co and (i) colonia sediment oriente

Now W

ILIPITRO

**FIGURESHITS** important pa murphulogy empercal n masquit cu direction to Hiswever, non-uniform amegonőn transported s the bed mate dis. for which proposed by Winter, 1973 employed as purticle distr perticular is distributed g displayed for with the geo single fixed s