

International Symposium on Soil Management for Sustainable Agriculture

by UGSAS-GU, 2017
JAPAN

KEYNOTE SPEECHES

Akira WATANABE (Nagoya University): Soil Organic Matter Dynamics
Yasushi MORI (Okayama University): Soil Physical Rehabilitation
Fumitoshi IMAIZUMI (Shizuoka University): Erosion Control Engineering
Yuki KOJIMA (Gifu University): Soil Water and Energy Dynamics

14 ALUMNI/GUEST SPEECHES

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by May 31, 2017.

3-Day Session of August 28 - 30, 2017
at the United Graduate School of
Agricultural Science, Gifu University



International Symposium on Soil Management for Sustainable Agriculture 2017

PROGRAM -PART 1-

DAY ONE: Monday, August 28

Time: 9:30-19:30

Venue: Main Seminar Room (6F in UGSAS Building, Gifu University)

Master of Symposium: Prof. Kohei Nakano (Gifu Univ.)

Time Table

- | | |
|------------------|---|
| 9:30-10:00 | Registration |
| 10:00-10:05 | Opening Remarks
Prof. Masateru SENGE (Dean of UGSAS, Gifu Univ.) |
| 10:05-10:10 | Welcome Speech
Dr. Fumiaki SUZUKI (Executive Director and Vice President of Gifu Univ.) |
| 10:10-10:50 | Keynote Speech 01
Prof. Yasushi MORI (Okayama Univ.): Soil Physical Rehabilitation |
| 10:50-11:30 | Keynote Speech 02
Assist. Prof. Yuki KOJIMA (Gifu Univ.): Soil Water and Energy Dynamics |
| Session 1 | —General Issue and Solution— Session Chair: Prof. Muhajir Utomo (Lampung Univ.) |
| 11:30-11:55 | 01. Prof. Isril BERD (Andalas Univ.) |
| 11:55-12:20 | 02. Dr. Komariah (Sebelas Maret Univ.) |
| 12:20-12:30 | Photo Session |
| 12:30-13:40 | Lunch Break (Light meals served) |
| Session 2 | —Soil Science— Session Chair: Assistant Prof. Keigo NODA (Gifu Univ.) |
| 13:40-14:05 | 01. Prof. Muhajir UTOMO (Lampung Univ.) |
| 14:05-14:30 | 02. Dr. Afandi (Lampung Univ.) |
| 14:30-14:55 | 03. Mr. Didin Wiharso, M.Sc. (Lampung Univ.) |
| 14:55-15:20 | 04. Dr. Nuyen Thi Hang NGA (Thuy Loi Univ.) |
| 15:20-15:30 | Coffee Break |
| Session 3 | —Watershed Management— Session Chair: Associate Prof. Takeo ONISHI (Gifu Univ.) |
| 15:30-15:55 | 01. Dr. Khandra Fahmy (Andalas Univ.) |
| 15:55-16:20 | 02. Dr. Muhammad MAKKY (Andalas Univ.) |



- 16:20-16:45 03. Dr. Eri Gas EKAPUTRA (Andalas Univ.)
- 16:45-17:10 04. Mr. Fadli IRSYAD, M.Sc. (Andalas Univ.)
- 17:40-19:30 Dinner Meeting (At Gifu University Restaurant (1))

DAY TWO: Tuesday, August 29

Time: 9:00-17:40

Venue: Main Seminar Room (6F in UGSAS Building, Gifu University)

Master of Symposium: Prof. Ken HIRAMATSU (Gifu Univ.)

Time Table

- 9:00-9:30 Registration
- 9:30-10:10 Keynote Speech 03
Prof. Akira WATANABE (Nagoya Univ.): Soil Organic Matter Dynamics
- 10:10-10:50 Keynote Speech 04
Assoc. Prof. Fumitoshi IMAIZUMI (Shizuoka Univ.): Erosion Control Engineering
- 10:50-11:00 Coffee Break

Session 4 —Soil Biology & Microbiology— Session Chair: Prof. Isril Berd (Andalas Univ.)

- 11:00-11:25 01. Dr. Retno Rosariastuti (Sebelas Maret Univ.)
- 11:25-11:50 02. Dr. Sudadi (Sebelas Maret Univ.)
- 11:50-12:15 03. Dr. Widyatmani Sih Dewi (Sebelas Maret Univ.)
- 12:15-13:20 Lunch Break (Light meals served)

Session 5 —Soil Chemistry— Session Chair: Dr. Retno Rosariastuti (Sebelas Maret Univ.)

- 13:20-13:45 01. Prof. Fusheng Li (Guangxi Univ.)
- 13:45-14:10 02. Dr. Mujiyo (Sebelas Maret Univ.)
- 14:10-14:35 03. Ms. Dinh Thi Lan Phuong, M.Sc. (Tyui Loi Univ.)
- 14:35-15:10 Break & Preparation for Poster Presentation Session
- 15:10-17:00 -PART 2- *Please refer to the next page for details.
UGSAS-GU & BWEL Joint Poster Session on
Agricultural and Basin Water Environmental Sciences

DAY THREE: Wednesday, August 30

Time: 10:00-17:00

Study Tour on Soil and Water Management

Visiting TANIGUMI Historic Temple and Local Irrigation System &
TOKUYAMA DAM with Underground Facility for Water Management



UGSAS-GU & BWEL Joint Poster Session on Agricultural and Basin Water Environmental Sciences

PROGRAM -PART 2-

DAY TWO: Tuesday, August 29

Time: 15:10-17:00

Venue: Main Seminar Room (6F in UGSAS Building, Gifu University)

Time Table

15:10-16:45	Poster Presentation
16:45-16:55	Best Presentation Award ceremony
16:55-17:00	Closing remarks <i>Prof. Fusheng LI (Head of the Promotion Office of Gifu University Rearing Program for Basin Water Environmental Leaders (BWEL))</i>

Presenters

- P01: Tran Duy Quan (UGSAS-GU)
P02: Ning Li (UGSAS-GU)
P03: Dina Istiqomah (UGSAS-GU)
P04: Akash Chandela (UGSAS-GU)
P05: Daimon Syukri (UGSAS-GU)
P06: Witchulada Yungyuen (UGSAS-GU)
P07: Panyapon Pumkaeo (Graduate School of Integrated Science and Technology, Shizuoka University)
P08: Arif Delviawan (Graduate School of Integrated Science and Technology, Shizuoka University)
P09: Siwattra Choodej (UGSAS-GU)
P10: Jobaida Akther (UGSAS-GU)
P11: Annisyia Zarina Putri (Graduate School of Applied Biological Sciences, Gifu University)
P12: Masaya Toyoda (Graduate School of Engineering, Gifu University; BWEL)
P13: Tharangika Ranatunga (UGSAS-GU; BWEL)
P14: Shuailei Li (Graduate School of Natural Science and Technology, Gifu University; BWEL)
P15: Ruoming Cao (Graduate School of Applied Biological Sciences, Gifu University; BWEL)
P16: Fenglan Wang (UGSAS-GU; BWEL)
P17: Diana Hapsari (UGSAS-GU; BWEL)
P18: Ran Song (Graduate School of Engineering, Gifu University; BWEL)
P19: Chen Fang (UGSAS-GU; BWEL)
P20: Guangyu Cui (Graduate School of Engineering, Gifu University; BWEL)
P21: Ali Rahmat (UGSAS-GU; BWEL)
P22: Junfang Zhang (Graduate School of Engineering, Gifu University; BWEL)
P23: Siyu Chen (UGSAS-GU; BWEL)
P24: Wenjiao Li (Graduate School of Engineering, Gifu University; BWEL)
P25: Huijuan Shao (UGSAS-GU; BWEL)

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-PART 1-

INTERNATIONAL SYMPOSIUM ON SOIL MANAGEMENT

FOR SUSTAINABLE AGRICULTURE

2017

KEYNOTE SPEECHES

ORGANIZER:

THE UNITED GRADUATE SCHOOL OF AGRICULTURAL SCIENCE,
GIFU UNIVERSITY

The Evaluation of Watershed Condition of Sumani Based in Solok Regency Based on Land Characteristic

ODelvi Yanti, Khandra Fahmy, Isril berd, Fery Arlius

(Faculty of Agriculture Technology, Andalas University, Indonesia)

SUMMARY

The functions of watershed have decreased from year to year as a results of environmental degradation. Uncontrolled land use without regard to soil and water conservation leads to increase erosion and sedimentation, decreases of vegetation cover, and accelerates of land degradation. This study was conducted at watershed of Sumani, Solok Regency, West Sumatra. Analysis of watershed conditions used scoring and weighting methods. The parameters used in this study referred to Regulation of the Forestry Ministry of Indonesia number .P.61 / Menhut-II / 2014 including critical land, vegetation cover, and erosion index. The results of study show that watershed condition based on 2016 data was very bad category, with the class for each parameter was very high (critical land), very bad (vegetation cover), and very high (erosion index). Watershed conditions are closely related to watershed management systems. Increased demands on natural resources (water, land and forests), cause changes to the watershed conditions.

Introduction

Watershed has a function to accommodate, store, and drain of water from rainfall to the lake or to the sea naturally. The functions of watershed from year to year have decreased, as a result of watershed environmental degradation. It was caused by significant change of land use, population growth, and lack of public awareness of watershed conservation.

Sumani basin which located in Solok experienced degradation of its function. The Lembang and Sumani are the rivers across this Basin which face the problem of water shortage and low water quality due to the high sediment. It was occurred due to forest clearing for expansion of agricultural areas and vegetable plantations (Farida et al., 2005). It can be seen from the fluctuation of debit (flood or drought) in two rivers that cross the Sumani Basin.

The condition of a watershed is closely related to the watershed management system. The watershed conditions from land aspects can be seen from critical land conditions, vegetation cover and erosion rates. The objectives to be achieved were: to know the condition of the Sumani Basin from the land aspect so that it can be assessed to the management system.

Material and Method

This research was conducted at Sumani Basin of Solok Regency with wide of 58,330 Ha. The location of the Sumani Basin is located at 100032'41 "EL- 100040'40" EL and 0042'17 "SL-002'2" SL, which is located at an altitude of 300-2500 m above sea level.

The data used in this study are secondary data consisting of Sumani watershed map, satellite image, slope map of sumani basin, soil type map, soil solum map, DEM / SRTM data, rainfall data (10 years) from each nearest station in DAS Sumani.

The study was conducted by using scoring and weighting method. Indicators and parameters for watershed environmental sustainability of land criteria based on Minister of Forestry Regulation No.P.61 / Menhut-II / 2014 including the critical land, erosion index, and vegetation cover.

Result and Discussions

The Critical Land

The characteristics of land in Sumani Watershed of Solok Regency (Table 1) were dominated by agricultural land (29.35%), rice field (25.72%), and mixed plantation (17.19%). Land use was closely related to people's livelihoods. Based on the data of Solok District BPS in 2015, the population whose field of business in agriculture, forestry, hunting and fishery were 59.72% of the total number of people in working age (15 years and above).

Based on Permenhut No. P. 61/Menhut-II/2014, the percentage of critical land is the ratio of critical land area to the width of the watershed, which the critical land is critical and highly critical land.

Table 1 shows that 30.85% of the total area of DAS was at a very critical land level around 17,996.76 ha, and land in critical condition of 14.10% or around 8,222.14 ha. The distribution of land criticality is also presented In

Figure 1, so that the percentage of Critical Land (PLK) was 44.95%.

Table 1 Distribution Data of Land Critical Level of Sumani Watershed in Solok District.

No	Land Critical Level	Large	
		Ha	(%)
1	Not Critical	6,566,4	11,26
2	Critical Pontential	3,972,54	6,81
3	Smewhat Critical	21,572,16	36,98
4	Critical	8,222,14	14,10
5	Very Critical	17,996,76	30,85
Total		58,330	100,00

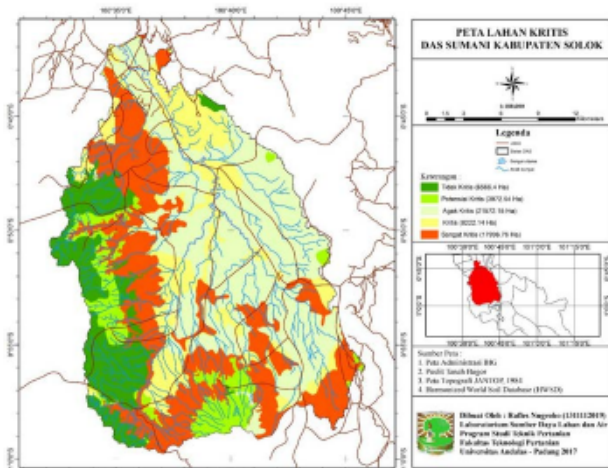


Fig.1 Map Distribution of Land Critical Level on Sumani Watershed of Solok Regency

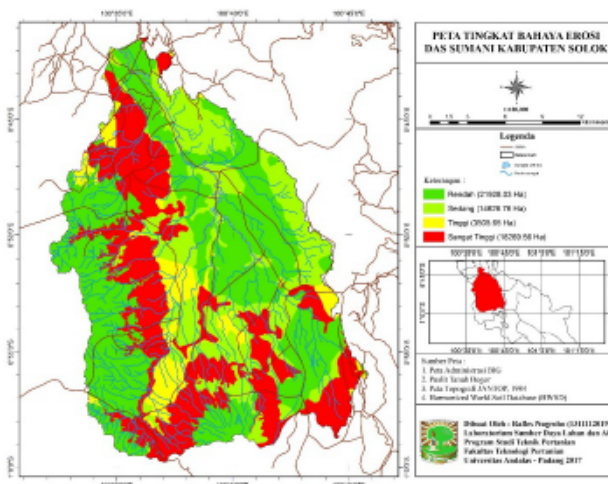


Fig.2 Distribution of Erosion Danger Level of Sumani Watershed in Solok Regency.

Erosion Index

The erosion occurring in Sumani Watershed of Solok Regency varies from very mild to very heavy, as shown in Figure 2.

Based on the calculation of erosion result using

ArcGIS, the erosion value was 2,160,431,790 ton/year or 37,038.09 ton/ha/year. While the value of Tolerable Soil Loss (TSL) obtained was 1,749,900 ton/year or 30 ton/ha/year, then the value of erosion index was 1,234,603. It could be concluded that the erosion occurring in Sumani District of Solok Regency was to very high classification.

Vegetation Cover

Closure of vegetation on a land describes the use of the land. Data of vegetation cover with permanent vegetation was obtained from secondary data of image identification, the cover of vegetation cover of Sumani River Basin. Permanent vegetation analyzed was annual crop, in the form of forest, shrub, and plantation. The area of permanent vegetation in Sumani District of Solok Regency was 23,905.14 ha, the percentage of Vegetation Closure (PPV) is 40.98%, which was classified as a moderate.

Conclusion

Based on the analysis of Sumani Watershed condition of Solok Regency was in very bad condition. Watershed conditions are closely related to watershed management systems. Increased demands on natural resources (water, land and forests), cause changes to the watershed conditions. The very poor watershed condition describes the watershed management system was also in a very bad category. It has been directly illustrated that the utilization of the Sumani River Basin of Solok regency does not pay attention to soil and water conservation rules, causing the increase of critical land, decreasing vegetation cover, and increasing erosion hazard.

Acknowledgement

Thank you very much to Faculty of Agricultural Technology, Andal's University for supporting this research.

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