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Editors:

Toshio IWAKUMA

Takashi INOUE

Takashi KOHYAMA

Mitsuru OSAKI

Herwint SIMBOLON

Harukuni TACHIBANA

Hidenori TAKAHASHI

Noriyuki TANAKA

Kazuo YABE

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**Graduate School of Environmental Earth Science
Hokkaido University, Sapporo and
Research and Development Center for Biology,
The Indonesian Institute of Sciences, Bogor**

Contents

Foreword	i
Preface	iii
Part 1. Peat Science	
1- 1 Analyses of the second layer of peat swamp Seiichi Tokura, Sawahiko Shimada, Hiroshi Tamura, Hidenori Takahashi and Norio Nishi	3
1- 2 The estimation of carbon resource in a tropical peatland: A case study in Central Kalimantan, Indonesia Sawahiko Shimada, Hidenori Takahashi, Masami Kaneko and Akira Haraguchi	9
1- 3 Preliminary study on geomorphology in the Central Kalimantan Plain with special reference to the tropical peat formation Kazoumi Hirakawa and Yoshiomi Kurashige	19
1- 4 Chemical compounds in gas emitted from tropical peat soil with burning with and without oxygen Masanori Okazaki, Chu-ichi Watanabe, Masato Yoshikawa, Chihiro Yamaguchi and Norio Yoshimura	27
1- 5 Some characteristics of tropical podzols in Kalimantan M. Djuwansah	33
Part 2. Soil Sciences	
2-1 Chemical properties of peat pore water in Central Kalimantan with special reference to vertical profile Akira Haraguchi, Sawahiko Shimada, Suwarno, Midori Akioka, Kazuo Yabe and Hidenori Takahashi	41
2-2 Boron contents of tropical peat soils in Southeast Asia Koyo Yonebayashi and Hidekazu Yamada	49
2-3 Microbial biomass in tropical peat soil Kazuyuki Inubushi and Abdul Hadi	55
2-4 Survey of peat soils in Sebangau-Kahayan water-catchment, Central Kalimantan for laccase producing fungi and their organic decomposing ability Typuk Artiningsih, Sehat Jaya Tuah, Edi Mirwanto and Mitsuru Osaki	61
2-5 Microbial population and greenhouse gases formation in tropical peatlands under different land uses Abdul Hadi and Kazuyuki Inubushi	69
2-6 Aspect and mechanism of peat fire in tropical peatland: A case study in Central Kalimantan, 1997 Aswin Usup, Suwido H. Limin and Hidenori Takahashi	79
2-7 Characterization and population of nitrogen-fixing bacteria from peat soil in Kahayan water-catchment, Central Kalimantan Sri Purwaningsih, Typuk Artiningsih, and Mitsuru Osaki	89
2-8 Measurement of water potential in plant and soil by the electric capacitance method Yoshio Kano	93

Part 3. Agriculture and Environment

3-1	Biological clean-up of biomass wastes using sawdust and an artificial soil matrix Minoru Terazawa	101
3-2	Whole aspect on nature and management of peat swamp forest in Thailand Tanit Nuyim	109
3-3	Management practices for sustainable cultivation of crop plants on tropical peatland Kamarudin Ambak and Lulie Melling	119
3-4	Utilization of inland peat for food crop commodity development requires high input and is detrimental to peat swamp forest ecosystem Suwido H. Limin, Layuniati and Yahya M. Jamal	135
3-5	Discussion on rural development of peat swamp area of Central Kalimantan from hydrological aspect Takashi Inoue	145

Part 4. Forest Ecosystem

4-1	Floristic composition of peat swamp forest in Mensemat-Sambas, West Kalimantan Mustaid Siregar and Edy Nasriadi Sambas	153
4-2	Preliminary study on growth, mortality and recruitment of tree species in peat swamp forest at Tanjung Puting National Park, Central Kalimantan Edy Mirwanto and Ruddy Polosakan	165
4-3	Preliminary study on the water relations of tropical peat land plants Beth Paul Naiola and Mitsuru Osaki	173
4-4	Checklist of plant species in the peat swamp forests of Central Kalimantan, Indonesia Herwint Simbolon and Edi Mirwanto	179
4-5	Plants diversity of peat swamp forest in Riau Province, Sumatra Johanis P. Moge and M. Mansur	191
4-6	Initial phase of secondary succession in the exploited peat swamp forest (<i>Shorea albida</i>) at Sungai Damit, Belait in Brunei Darussalam Shigeo Kobayashi	205
4-7	Proposed methodology on determination of photosynthetic capacity of peatland vegetation: soybean as a study case Tania June and Mitsuru Osaki	215
4-8	Litter decomposition process in two contrastive nutrient limited forest types in Central Kalimantan Joeni S. Rahajoe, Takashi Kohyama and Suwido H. Limin	223
4-9	Study on leaf element concentrations of some dominant tree species grown in peat swamp forest, Central Kalimantan Sehat Jaya Tuah, Mitsuru Osaki and Suwido H. Limin	233
4-10	Nitrogen and carbon cycles of peat swamp forests and surrounding areas in Narathiwat, Thailand, Inferred from $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ analyses Takeshi Matsubara, Narin Boontanon, Shingo Ueda, Proespichaya Kanatharana and Eitaro Wada	245
4-11	Mangrove litter-fall studies at the PT Freefort Indonesia project area Cecep Kusmana, Pratita Puradyatmika, Yahya A. Husin, Gerry Shea and Darrel Martindale	255

4-12	Vegetation analysis of Suaq Balimbing peat swamp forest, Gunung Leuser National Park-South Aceh Purwaningsih and Razali Yusuf	275
4-13	Primary production of a heath (kerangas) forest in Lahei, Central Kalimantan Kazuki Miyamoto, Takashi Kohyama, Eizi Suzuki and Herwint Simbolon	283

Part 5. Peatland and Technology

5-1	Photosynthetically active radiation transmittance within alder (<i>Alnus japonica</i> Steud) stand in Kushiro Mire Bismart Ferry Ibie and Hidenori Takahashi	291
5-2	Water balance of a peat swamp forest in the upper catchment of the Sebangau River, Central Kalimantan, Indonesia Masayuki Kayama, Hidenori Takahashi and Suwido H. Limin	299
5-3	Polycyclic aromatic hydrocarbon (PAHs) in Central Kalimantan Nori Tanaka, Siwat Pongpiajun, Shuniz Tanaka and Toshio Iwakuma	307
5-4	River and peatland technology in the Sebangau River basin Tadaoki Itakura, Harukuni Tachibana, Hidenori Takahashi, Mitsuhiko Kamiya, Koken Utozawa, Nyoman Sumawijaya, Inga Torang, Untung Darung, Suwido H. Limin and Suprihanto Notodarmojo	315
5-5	The effects of environmental factors on diurnal changes of ground water table in a tropical peat swamp forest Hidenori Takahashi, Masayuki Kayama and Suwido H. Limin	321
5-6	Application of remote sensing and GIS to monitor peatland multi-temporal in Central Kalimantan H.-D.V. Boehm and F. Siegert	329
5-7	Infiltration test on the Palangkaraya peat Nyoman Sumawijaya	349

Part 6. Aquatic Environment

6-1	Ground water recharge in Central Kalimantan deducted from isotopic hydrology Nori Tanaka, Siwat Pongpiajun and Toshio Iwakuma	359
6-2	Surface water quality in Central Kalimantan, Indonesia Masaaki Kurasaki, Dede I. Hartoto, Takeshi Saito, Mika Suzuki-Kurasaki and Toshio Iwakuma	367
6-3	Relationship of water level to water quality in an oxbow lake of Central Kalimantan Dede I. Hartoto	375
6-4	Limnological characteristics of Lake Rengas fishery reserve in Central Kalimantan Awalina and Dede Irving Hartoto	387
6-5	Distribution of Phytoplankton in some oxbow lakes of Central Kalimantan Sulastri and Dede I. Hartoto	397
6-6	Seasonal changes of phytoplankton species in relation to environmental factors in an oxbow lake of Central Kalimantan, Indonesia Kumiko Kusakabe, Toshio Iwakuma and Sulastri	413

6-7	Effect of artificial mixing of surface and bottom waters and lime treatment on the abundance and primary productivity of phytoplankton in Lake Sabuah Ardianor, Enan M. Adiwilaga, Hefni Effendi and Fifi Widjaya	423
6-8	Turnover rate of aquatic macrophytes in the irrigation ponds around Lake Shinji and Lake Nakaumi, Japan Hiedenobu Kunii	437
6-9	A Preliminary study on the dynamics of zooplankton community in two humic lakes of Central Kalimantan Sulmin Gumiri, Abdul Hafid, Toshio Iwakuma, Ryo Komatsu and Kumiko Kusakabe	443
6-10	Diel and seasonal feeding activities of fishes in an oxbow lake of Central Kalimantan, Indonesia Ryo Komatsu, Sulmin Gumiri, Dede Irving Hartoto and Toshio Iwakuma	455
6-11	Concept for developing sustainable local fish resource in Central Kalimantan Matling Torang and Tariono Buchar	471

Part 7. Human Dimensions

7-1	Role of peat forest in the Banjarese traditional land management (BTLM) system Budi Mulyanto, Basuki Sumawinata, Suwardi and Gunawan Djajakirana	483
7-2	The massive exploitation of peat swamp forest potentiality has not successfully increased the local people's prosperity in Central Kalimantan Suwido H. Limin and Patricia Erosa Putri	491
7-3	Rehabilitation of devastated peat lands and establishment of sustainable agro-systems through buffer zone planning in Central Kalimantan Mitsuru Osaki, Hanny Wijaya, Suwido Hester Limin and Herwint Simbolon	499
7-4	Livelihood role of inland floodplain ecosystem for local community related to fisheries commodity: A review Uras Tantulo Palis	503
7-5	Socio-economic values of wetlands for Dayak community in Central Kalimantan Tampung N. Saman and Suwido H. Limin	515
7-6	Problems of developing ruminants livestock in inland peat of Central Kalimantan Robertho Imanuel Aden	529

Appendix

List of participants	535
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Foreword

Tropical peatland is one of the seriously endangered ecosystems on the earth, which currently is facing serious consequence of climate and developmental perturbation. The needs for better management and sustainable development mandate detailed study of the ecosystems from many aspects. The JSPS (Japan Society for the Promotion of Science)-LIPI (Indonesian Institute of Sciences) Core University Program entitled "Environmental Management of Tropical Wetland Ecosystem in Southeast Asia" (1997-2006) was established in 1997 for filling up the needs.

During the past 3 years basic knowledge on tropical peatlands have been accumulated to a greater extent both within the first 3-years' collaboration within this program and the research conducted by various other projects. We organized an International Symposium on Tropical Peatland Management (TROPEAT99) for the purpose of discussing results of the studies conducted under the program, and also gathering and exchanging any other information related to tropical peatland ecosystems obtained from other studies. The symposium was also designed to clarify the main issues to be addressed and future directions in tropical peatland management.

The two-day symposium was very successful resulting in more than 60 presentations and hot discussion. The exchange of knowledge must have enhanced the progress of the science on tropical peatlands and the ecosystems in their watershed areas. We believe that the present volume which contains state-of-the-art of the tropical peatland science is useful for scientists, students and also policy makers and will promote the collaboration in the future.

Norio NISHI
Dean,
Graduate School of
Environmental Earth Science
Hokkaido University

Arie BUDIMAN
Director,
Research and Development Center for
Biology
Indonesian Institute of Sciences

Preface

The knowledge on wetlands has been improved year by year with the growing global concern on the importance of the ecosystem in maintaining biodiversity and climate both locally and globally since the international conventions on wetlands in 1970s (the Ramsar Convention) and on biodiversity in 1990s. However the ecosystems of tropical wetlands are still far less understood in comparison with the temperate wetlands. The rate of deforestation in tropical peatlands, which highly depends on the economic pressure, is accelerating and it urges us further to accumulate our knowledge on the wetlands for developing the proper conservation strategy.

The purpose of the International Symposium on Tropical Peatlands (TROPEAT99) held at Ciloto, Bogor, Indonesia during 22-23 November 1999 was to meet the needs. The number of contributors was, to our excitement, larger than our expectation, so that the meeting was held in parallel oral sessions and a poster session. About 170 participants attended from Japan, Indonesia, Malaysia, Thailand and Germany to present the most up-to-date knowledge on science of tropical peatlands to address the issues on conservation and management of the area.

This volume consists of 7 parts. Part 1 ("Peat science", 5 papers) deals with the physico-chemical properties and geomorphological background of the formation of peat in Southeast Asia. In Part 2 ("Soil science", 8 papers), biochemical and microbial processes in the tropical soil systems are discussed. Chemical properties in the peat pore water and a new methodology for obtaining water potential are presented. In Part 3 ("Agriculture and environment", 5 papers), various strategies of peatland management are presented from the experiences in Thailand, Malaysia, Indonesia and Japan. A total of 13 papers are compiled in part 4 ("Forest ecosystem"), covering the topics of natural vegetation, plant succession in exploited area, photosynthesis, litter-fall and its decomposition, elemental composition of leaf and nitrogen and carbon cycles within a peat swamp forest, and a heath forest. In Part 5 ("Peatland and technology", 7 papers), meteorological and hydrological properties are discussed based on the in situ monitoring and the infiltration test in Central Kalimantan. Examples of applying satellite imagery and GIS are also demonstrated in analyzing the vegetation change caused by deforestation and land fire events. In Part 6 ("Aquatic environment", 11 papers), physico-chemical properties and biological features, i.e., phytoplankton, zooplankton and fish, are examined in relation to the drastic change in water level in humic oxbow lakes. Other topics are the application of stable isotope to the study on groundwater hydrology in Kalimantan and the turnover of aquatic macrophytes in irrigation ponds in Japan. This symposium also featured the topics of "Human dimensions", which makes it unique in this kind of symposium. Six papers on the topics appear in Part 7. The traditional methods of exploitation and management of peat swamp forests are re-evaluated and put in contrast with the modern massive exploitation. Several study plans are presented to establish a buffer zone between natural and exploited areas and to utilize peatland systems for fisheries and to raise livestock. Forest or land fire occurs frequently in tropical peatlands, causing a severe health problem in ENSO years such as in 1997. Several papers report how the fire spread over the peat soil (Part 2), chemical compounds emitted from burning peat (Part 1) and the fate of polyaromatic hydrocarbons in the presence of humic substances in the field (Part 5).

In the present volume tropical peatland ecosystems are examined from various angles combining the hottest issues in environmental sciences. Many studies are conducted in close connection to each other at the same locations of Kalimantan in the same period, which indeed made this volume comprehensive. However, the most startling feature of the volume is its inclusion of the important papers conducted outside this region. With these contributions, it has been made possible to present comparative and universal scientific outcome on tropical peatlands.

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Editors