Proceedings of the International Symposium on:

TROPICAL PEAT LANDS

Bogor, Indonesia, 22-24 November 1999

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March 2000

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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.

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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.

Sapporo
March 2000
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