

Program for Advancing Strategic International Networks to Accelerate the Circulation of Talented Researchers
Japan-ASEAN Collaboration Research Program on Innovative Humansphere in Southeast Asia:
In Search of Wisdom toward Compatibility Growth and Community in the World

Dispatch Report

Year: 2015-2016

Place of fieldwork: Indonesia and Singapore

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- Research background

Wetlands are special ecosystems which are flooded for a long period of time or with great frequency during the year. Organisms that grow in wetlands adapt to this special environment. In Southeast Asia, the natural wetland ecosystems are aligned in order of mangrove forests, brackish water wetland forests, freshwater swamp forests and peat swamp forests from coastal to inland areas [Corlett 2009]. These wetlands are established under a sensitive balance of many kinds of organisms involving plants, animals and microorganisms. The ecosystems are very fragile and the effect of environmental change can result in catastrophic damage. Mangrove and peat swamp forests are the dominant wetland ecosystems in this region. However, forest degradation by development is found in many parts of wetlands and is no longer negligible.

Peat swamp forests function as carbon stocks and as a cradle of biodiversity. However, the function of peat swamp forests has become degraded and huge amounts of carbon emissions have begun during the past two decades. This has now become a worldwide issue. In particular, frequent peat fires, which occur in the dry season, destroy the forest ecosystems and cause extensive damage to human health by air pollution to the local and native countries. On the other hand, mangrove forests, which once covered most of the coastal areas of the Southeast Asia region, have been cut down to construct prawn ponds or produce charcoal. In this study, I will identify the effects of human activities on these ecosystems using insights from ecology.

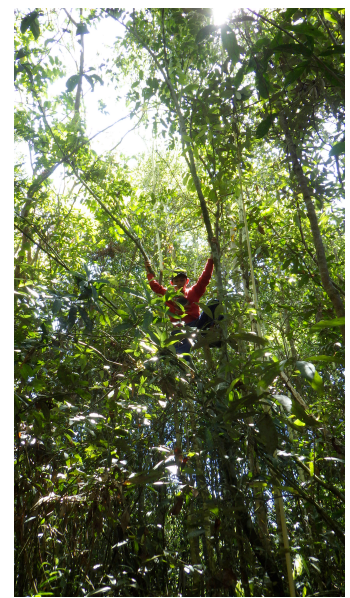
- Research purpose and aim

- Results and achievements by fieldwork

Tropical peat swamp forests, which are found in Indonesia, Malaysia and Brunei in Southeast Asia, are an important ecosystem because of their special characteristics. However, in recent years, the remarkable degradation and loss of forests by human disturbance has become a serious issue. In particular, peat fires have recently become a major environmental problem, not only destroying the ecosystem, but also bringing health damage caused by smoke pollution to the local area in Indonesia



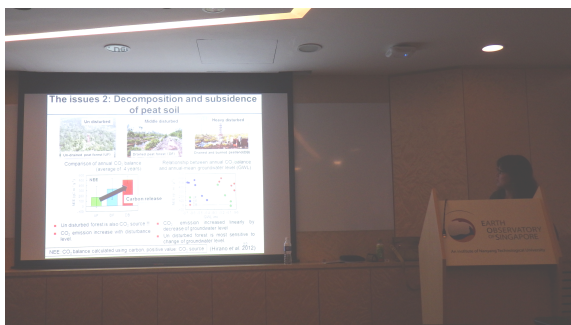
Sampling of eaves
In a peat swamp forest



CO2 flux tower

and neighboring countries. On the other hand, in Malaysia, although peat fire damage is not seen in that country, most of the peat swamp forests have been developed as oil palm plantations, and forest fragmentation and degradation has occurred. However, Brunei has maintained its peat swamp forests in a pristine condition up to today. I stayed at Nanyang Technological University, and joined the research team of the National University of Singapore that has been carrying out field research in the peat swamp forests of Brunei. I will conduct comparative research on ecosystems in peatlands in Indonesia, Malaysia and Brunei.

In addition, forests have been maintained as watershed forests in Singapore since the 1960s. These are secondary forests that have developed after the abandonment of villages. Secondary forests that have experienced anthropogenic disturbance are suitable for studying models of forest recovery. I will therefore carry out studies in a variety of environments in secondary forests in Singapore.



Presentation for corllaborator



Field course of species identification

- Implications and impacts on future research

During my past stay in Indonesia, Malaysia and Singapore under this project, I carried out the inspection of various type forests distributed around Southeast Asia. I now roughly understand the current situation of the forests in this region. I will continue data collection and prepare a paper on the state and problems of the forests there. At the same time, I will continue to write some papers related to Indonesian peat swamp forests. In addition, to maintain the collaboration that has been built up during this project, I will continue to carry out our research with the co-researchers.

References

Richard T. Corlett, 2014, The Ecology of Tropical East Asia, OUP Oxford