

Chair Forest Resource Management

2.2.2 Laboratory : Laboratory of Tropical Forest Resources and Environm

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| Member: | Professor | Ohta, Seiichi, Dr. Agric. Sci |
| | Associate Professor | Kanzaki, Mamoru, Dr. Sci |
| | Assistant Professor | Kaneko, Takayuki |
| | Doctor's program | 7 |
| | Master's Program | 8 |
| | Undergraduate | 5 |
| | Other | 1 |
| | Program-Specific Researcher | 1 |

A. Research Activities (2010.4-2011.3)

A-1. Main Subjects

a) Elements cycling and sustainable management of industrial tree plantations in the tropics

To evaluate and predict the sustainability of industrial plantation rapidly expanding in the devastated land in the tropics, and to present the measures to solve the related problems, the researches have been initiated on budget of nutrient elements and GHEG in soil-plant systems of industrial tree plantation of leguminous species and also on the mechanism of their fluctuation with forestry practices. The soil management for the reduced emission of GHEG is also studied.

b) Soil ecology and forest distribution in the area of tropical seasonal forests

To elucidate the factors which controlling the distribution of evergreen forest and deciduous forest in tropical seasonal region, the soil physical characteristics as mechanical composition, pore distribution and hydraulic conductivity, and structure, species composition and leaf area index of forests for major soil-forest combinations are studied in Northeastern Thailand.

c) Carbon sequestration function of tropical seasonal forests and its fluctuation

For the quantitative evaluation of the carbon sequestration function of forest, members of the laboratory are studying at a tropical seasonal evergreen forest of Thailand and a mangrove forest of Myanmar with special reference to coarse woody debris (CWD) and long-term forest dynamics

d) Maintenance and regeneration mechanism of tropical forests

For elucidating the maintenance and natural regeneration mechanisms of tropical forests, dynamics of seedlings and saplings and insect-plant interactions of several forest types are being studied. Furthermore, various disturbances to forests, such as fire and slash-and-burn activity of human beings in the areas of rainforest, seasonal forests and montane forests in Asian tropics are also being studied.

e) Inventory and monitoring of plants in the canopy layer of a tropical montane forest

To clarify the diversity and long-term dynamics of plants growing in canopy layer, such as epiphyte, parasite, strangler and liana, field survey is conducting in a tropical montane forest of northern Thailand.

f) Sustainability and ecological services of selectively logged forest with intensive planting in Indonesia

Ecological sustainability of selective logging is tested based on the population dynamics and biomass changes in Indonesia where the intensive planting was adopted as standard management method. Ecological services of the forest, such as biodiversity and carbon pool function, are also examined.

A-2.Publications and presentations

a) Publications

Original Papers(including book-reviews)

- Yonekura, Yusuke., Ohta, Seiichi., Kiyono, Yoshiyuki., Aksa, Darul., Morisada, Kazuhito., Tanaka, Nagaharu., Kanzaki, Mamoru.: Changes in soil carbon stock after deforestation and subsequent establishment of “Imperata” grassland in the Asian humid tropics. Plant and soil 329: 495–507, 2010

- Yamashita, N., S.Ohta, H.Sase, J.Luangjame, T.Visaratana, B.Kietvuttinon,H.Garivait, M.Kanzak. Seasonal and spatial variation of nitrogen dynamics in the litter and surface soil layers on a tropical dry evergreen forest slope. Forest Ecology and Management 259: 1502-1512. 2010

- Mori T., Ohta S, Ishizuka S, Konda R, Wicaksono A., Heriyanto J. and Hardjono A. (2010) Effects of P addition on CO₂, N₂O, and NO emissions from a tropical secondary forest soil of South Sumatra, Indonesia. Proceedings of IUFRO Conference, 23-28 August, Seoul, Korea

- Chiaki Kawabata C., Ohta S., Ishizuka S., Wicaksono A. and Heriyanto J. (2010) Effect of DOM (Dissolved Organic Matter) derived from litter of *Acacia mangium* and *Eucalyptus pellita* on soil N₂O emissions, Proceedings of 19th World Congress of Soil Science, 1-6 August 2010, Brisbane, Australia

- Toriyama J., Ohta S., Ohnuki Y., Araki M, Det S., Lim S., Pol S., and Pith P. (2010) Physicochemical characteristics of plinthic and non-plinthic soils in dry deciduous forests on the bank of Mekong, Cambodia. Pedologist, 54, 2-10

- Konda, R., Ohta S., Ishizuka I., Herianto J. and Wicaksono A. (2010) Seasonal changes in the spatial structures of N₂O, CO₂, and CH₄ fluxes from Acacia mangium plantation soils in Indonesia. *Soil Biology and Biochemistry*, 42, 1512-1522

- Mori T., Ohta S., Ishizuka S., Konda R., Kawabata C., Wicaksono A., Herianto J. and Hardjono A. (2010) Dose phosphorous addition mitigate the N₂O and NO emissions from an Acacia mangium soil? *Special Issue of Research Journal of Chemistry and Environment*, 324-328.

- Ishizuka S., Ohta S., Konda R., Gobara Y., Mori T., Hamotani Y., Kawabata C., Wicaksono A., Heriyanto J. and Hardjono A. (2010) N₂O emission in Acacia mangium stands with different ages, in Sumatra, Indonesia. *Proceedings of 19th World Congress of Soil Science*, 1-6 August 2010, Brisbane, Australia

- Mori T., Ohta S., Ishizuka S., Konda R., Wicaksono A., Heriyanto J. and Hardjono A. (2010) Effects of phosphorus addition on N₂O emission in Acacia mangium plantation with and without root exclusion, *Proceedings of 19th World Congress of Soil Science*, 1-6 August 2010, Brisbane, Australia

- Sen Nishimura, Tsuyoshi Yoneda, Shinji Fujii, Erizal Mukhtar, Mamoru Kanzaki, and Seiichi Ohta. 2011. Sprouting traits of Fagaceae species in a hill dipterocarp forest, Ulu Gadut, West Sumatra. *Journal of Tropical Ecology* 27: 107-110.

- Inada T., Saito H., Gaman S., Inoue T., Suwido L., Shibuya M. & Koike T., High-temperature effects on seed germination in Shorea balangeran, a tropical peat swamp tree in Central Kalimantan, Indonesia., *Symposium Proceedings IUFRO seed symposium: Recent Advances in Seed Research and Ex Situ Conservation*, Taiwan forestry research institute, pp.49-54, 2010

Reviews

- Konda R., Ohta S., Ishizuka S., Heriyanto J, and Wicaksono A. (2010) Spatial-temporal variabilities of N₂O emission from Acacia mangium soils. Proceedings of 19th World Congress of Soil Science, 1-6 August 2010, Brisbane, Australia

Reports,others

- KANZAKI Mamoru, Intensive Planting in Selective Logging System of Indonesia: A Challenge to the Sustainable Forestry. Tropical Ecology Letters No. 78:7-12. 2010

b) Conference and seminar papers presented

- 121st the Japanese Forest Society Congress, Tsukuba, April 2010: 4 presentations
- 8th Annual Meeting of The Wood Carbonization Research Society, Tokyo, May 2010: 1 presentation
- The 8th World Bamboo Congress, Bangkok, Thailand September 2009 : 1 presentation

- International Soil Science Congress on “Management of Natural Resources to Sustain Soil Health and Quality”, Samsun, Turkey, May, 2010 : 1 presentation

- 20 th Annual Meeting of the Japan Society of Tropical Ecology, Hiroshima, June 2010: 5 presentations

- 19th World Congress of Soil Science, Brisbane, Australia, August 2010: 2 presentations

- IUFRO Tree Seed Symposium: "Recent Advances in Seed Research and ex situ Conservation" Taipei, Taiwan, August 2010: 1 presentation

- Japanese Society of Soil Science and Plant Nutrition in 2010, Hokkaido, September 2010: 3 presentations

- Symposium on the use of new techniques to understand gas exchange and carbon dynamics in the forest ecosystem, session 2, No.10, Kyoto, Japan, November 2010: 1 presentation

- 58th Annual Meeting of Ecological Society of Japan, Sapporo, March 2011: 3 presentations

- 122nd Annual Meeting of Japanese Forest Society, Shizuoka, March 2011: 6 presentations

- Annual Meeting of the Society of Agricultural Meteorology of Japan, Kagoshima, March 2011: 1 presentation

A-3.Off-campus activities 1

Membership in academic societies

- Ohta, Seiichi : The Japanese Forestry Society (Council member), Japanese Society of Forest Environment (Council member), Japanese Society of Pedology (Editor)

- Kanzaki, Mamoru : The Japanese Association of Tropical Ecology (Council member, Kira Prize Selection Committee Member), Kansai Organization of Nature Conservation (Council member), The Japanese Forest Society (Council member)

- Kaneko, Takayuki : The Japanese Association of Tropical Ecology (Auditor)

A-3.Off-campus activities 2

Research grants

1. Grants-in-aid for Scientific Research(KAKENHI)

- Kiban-kenkyu A : Ohta, Seiichi : Evaluation of the tropical fast growing species plantation as N₂O emission source and mitigation options

- Kiban-kenkyu A; : Hayashi, Takashi : Field examination of the performance of genetic modified poplar for the industrial plantation

- Kiban-kenkyu B : Kanzaki, Mamoru : Inventory and monitoring of plants in canopy layer of the tropical cloud forest: Construction of monitoring site

2.Other Research Grants

- Ministry of Environment : Ohta, Seiichi : Construction of super monitoring site and networking in middle to down stream area of Mekong River (Contract Research with Forest and Forest Products Research Institute).

- Strategic Funds for the Promotion of Science and Technology : Kanzaki, Mamoru : Creation of the Paradigm of Sustainable Use of Tropical Rainforest by the Intensive Forest management and Advanced Utilization of Forest Resources

- Mitsui & Co., Ltd. Environment Fund : Shigeo, Kobayashi : Research on the rehabilitation of tropical degraded forest and local community living with the forest.

A-4.International cooperations and overseas activities 1

International meetings(country,roles)

- Kanzaki, Mamoru : International Workshop
Explore Cloud Forest and Canopy: Aiming the Comprehensive Study of Canopy (Organizer)

International joint research, overseas research surveys

- Evaluation of the tropical fast growing species plantation as N₂O emission source and mitigation options, Ohta Seiichi (Indonesia)

- Forest recovery and restoration after cyclone Nargis impact in the mangrove forests of Myanmar, Kanzaki, Mamoru (Myanmar)
- Inventory and monitoring of plants in the canopy layer of a tropical montane forest, Kanzaki, Mamoru (Thailand)
- Studies on the sustainability and ecological service of Indonesian Selective Logging Forest, Kanzaki, Mamoru (Indonesia)

A-4.International cooperations and overseas activities 2

Visiting Research Scholars

- Visiting Research Scholar 2 (Indonesia)

B.Educational Activities(2010.4-2011.3)

B-1.On-campus teaching

a) Courses given

- Undergraduate level: Forest Science I (Ohta, Kanzaki), Tropical Forest Environment (Ohta), Tropical Forest Resources (Kanzaki), Practice in Environmental Science (Ohta, Kanzaki), Laboratory Course in Biological and Environmental Science I (Kanzaki, Kaneko), Laboratory Course in Forest and Biomaterials Biology (Kanzaki, Kaneko), Laboratory Course in Ecology (Kanzaki, Kaneko), Practice in University Forest I (Kanzaki, Kaneko). Practice in University Forest III (Kanzaki). Environmental Studies (Kanzaki), International Exchange Subjects (Kanzaki), Leading of Foreign Literature II (Ohta, Kanzaki)
- Graduate level: Tropical Forest Environment (Ohta), Seminar in Tropical Forest Resources and Environments (Ohta, Kanzaki), Practice in Tropical Forest Environments (Ohta, Kanzaki), Scientific Writing and Presentation in English (Kanzaki)

B-2.Off-campus teaching etc.

Part-time lecturer

- Kanzaki, Mamoru: Faculty of Science, Nara Women's University, Global Environmental Biology,
JICA Training Course: Conservation and Sustainable Management of Mangrove Ecosystem

B-3.Overseas teaching 1

International students

- International students : Doctral 2 (Myanmar 1, Indonesia 1) Research Students 1
(Myanmar)

B-3.Overseas teaching 2

Lectures and seminars

Kanzaki, Mamoru : Doctor course co-advisor (Faculty of Forestry, Kasetsart University)

Thailand : Southeast Asia Seminar(Lecturer)

Center for Southeast Asian Studies/Indonesian Institute of Science(Indonesia)

C.Other Remarks

- Ohta, Seiichi :Japanese Center for Environment and Health, Acid Deposition and Oxidants Research Center (ADORC), Soil and vegetation monitoring (Analyzing group member), ADORC, Interior data verification group (Committee member), ADORC, Working group for soil and vegetation (Committee member),, Supporting group for soil and vegetation task force (Committee member), Group for methodological development of catchment analysis (Committee member), Ministry of Environment, Corrdination Committee for Environmental Studies (Committee member); , Ministry of Environment, Project of counter-measure for acid deposition (Committee member); , Ministry of Environment, Project of counter-measure for acid deposition (Ecological Impact Sub-committee(Investigation Member));