Twenty-year activities of DIVERSITAS in Japan

International Scientific Framework

DIVERSITAS (1991-)

IBOY (2001-2002) "International Biodiversity Observation Year)

ILTER (1993-) "Int'l Long-term Ecological Research"

Inter-governmental framework

CBD (1992-) "Convention on Biological Diversity"

MA (2001-2005) " Millennium Ecosystem Assessment"

IPBES

"Intergovernmental Platform of
Biodiversity and Ecosystem Services"

GFOSS **GEO-BON** (2011-)

"Group of Earth Observations - Biodiversity Observation Network"

Regional-National Scientific Framework

DIWPA

IBOY (2001-2002) "International Biodiversity Observation Year)

JaLTER"

Inter-governmental framework

Aichi Targets (2010)

"Satoyama-Satoumi" Assessment

IPBES

"Intergovernmental Platform of
Biodiversity and Ecosystem Services"

J-BON, AP-BON

GEO-BON (2011-)

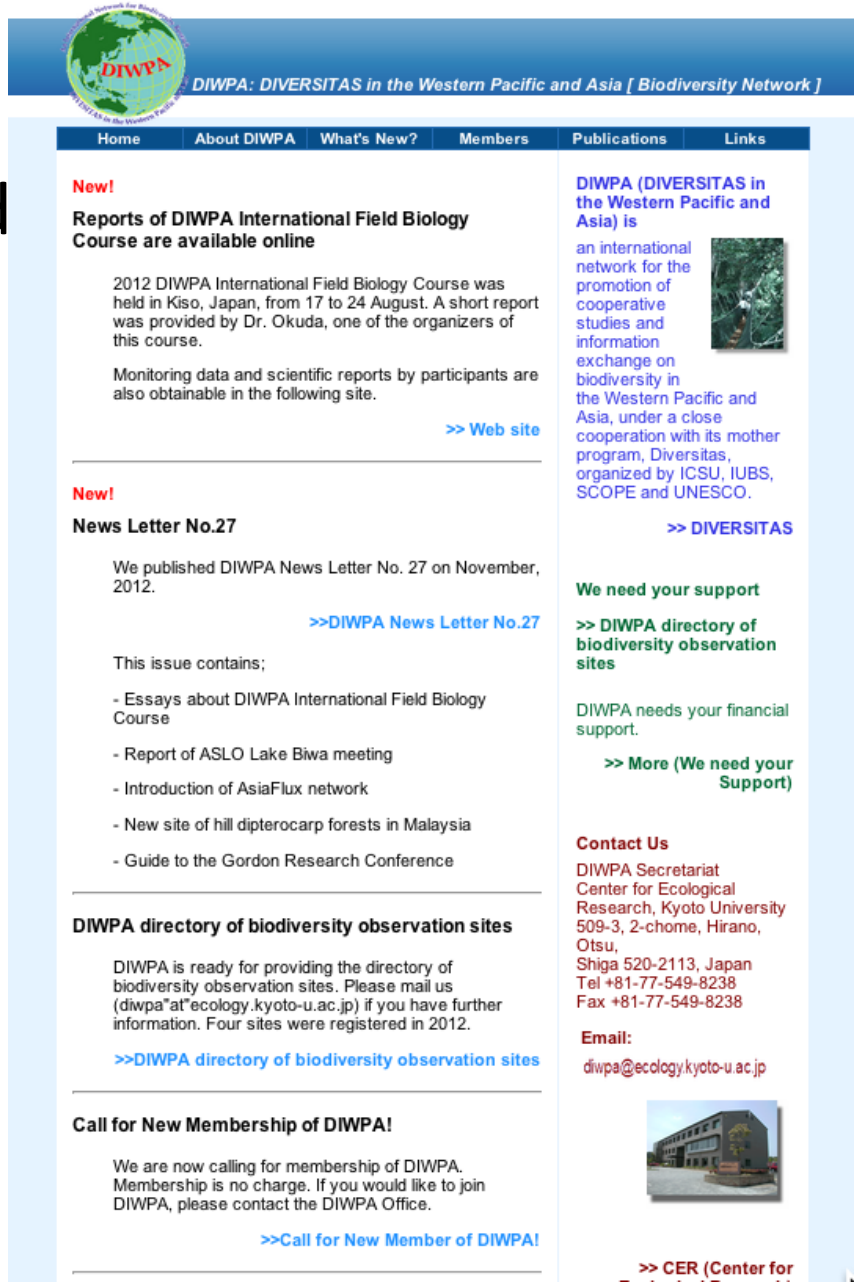
"Group of Earth Observations - Biodiversity Observation Network"

DIWPA

DIVEFRSITAS Western Pacific and Asia

Tamiji Inoue

proposed DIWPA and IBOY



Center for Ecological Research

Kyoto University (1991-)

DIWPA: 309 fits
(Google Scholar)

Journal of Vegetation Science 10: 763-860, 1999

SPECIAL FEATURE

Tree diversity and dynamics of western Pacific and eastern Asian forests

Editors

T. Nakashizuka, T. Kohyama, T.C. Whitmore & P.S. Ashton

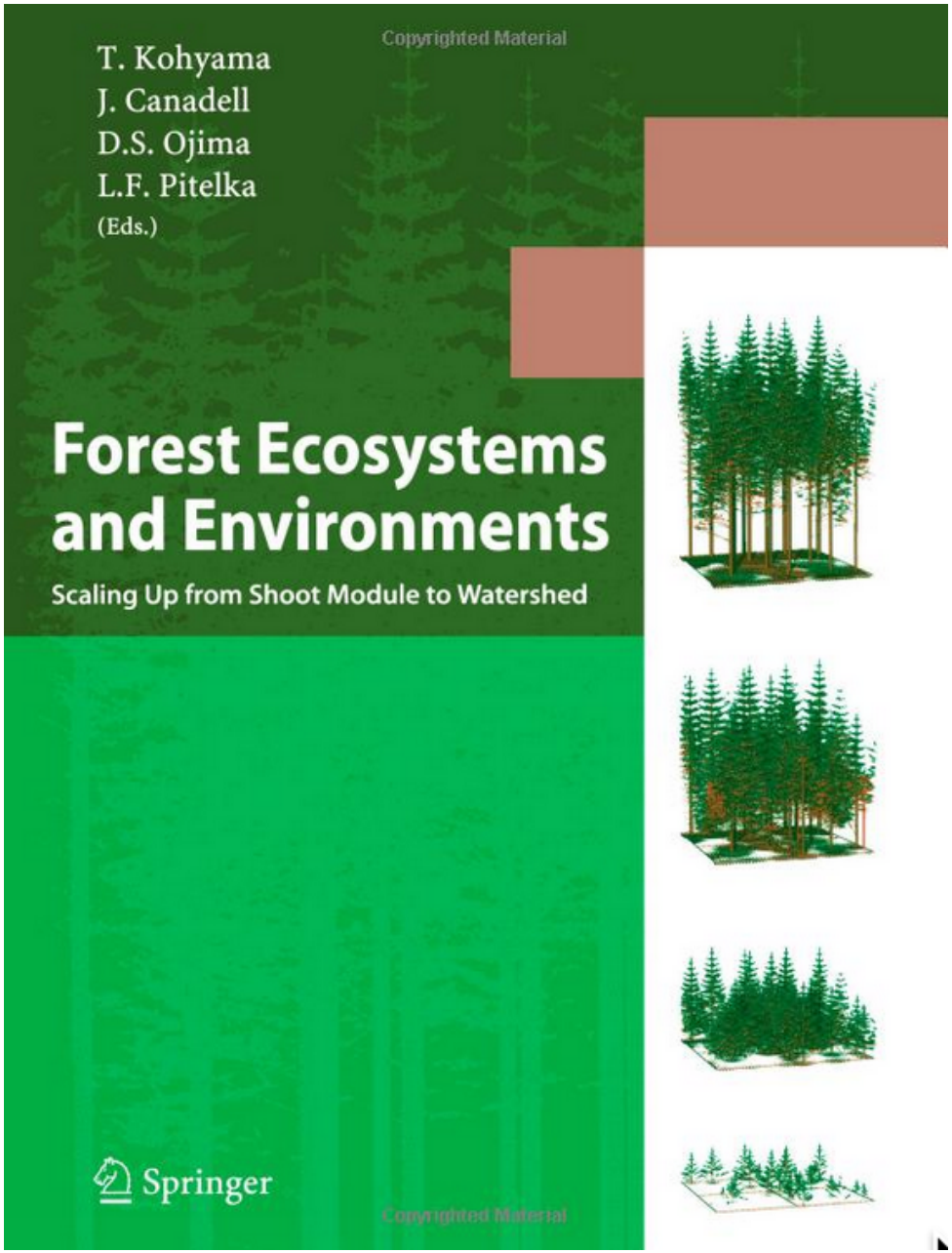
The papers in this special feature were presented in the International Workshop entitled 'Biodiversity and Dynamics of Forest Ecosystems in Western Pacific and Asia' held on 10 and 11 November 1997 in Kyoto, Japan

Contents

Nakashizuka, T., Kohyama, T., Whitmore, T.C. & Ashton P.S. — Tree diversity and dynamics of western Pacific and eastern Asian forests: An introduction 765

Burslem, D.F.R.P. & Whitmore, T.C. — Species diversity, susceptibility to disturbance and tree population dynamics in tropical rain forest 767
Marod, D., Kutintara, U., Yarwudhi, C., Tanaka, H. & Nakashisuka, T. — Structural dynamics of a natural mixed deciduous forest in western Thailand 777
Bunyavejchewin, S. — Structure and dynamics in seasonal dry evergreen forest in northeastern Thailand 787
Enright, N.J., Ogden, J. & Rigg, L.S. — Dynamics of forests with *Araucariaceae* in the western Pacific 793
Masaki, T., Tanaka, H., Tanouchi, H., Sakai, T. & Nakashizuka, T. — Structure, dynamics and disturbance regime of temperate broad-leaved forests in Japan 805
Umeki, K. & Kikuzawa, K. — Long-term growth dynamics of natural forests in Hokkaido, northern Japan 815
Bellingham, P.J., Stewart, G.H. & Allen, R.B. — Tree species richness and turnover throughout New Zealand forests 825
Takahashi, K. & Kohyama, T. — Size-structure dynamics of two conifers in relation to understorey dwarf bamboo: A simulation study 833
Hiura, T. & Fujiwara, K. — Density-dependence and co-existence of conifer and broad-leaved trees in a Japanese northern mixed forest 843
Sheil, D. — Tropical forest diversity, environmental change and species augmentation: After the intermediate disturbance hypothesis 851

GCTE-TEMA: 636 hits (Google Scholar) (1992-2003)



Ecol Res (2005) 20: 241–242
DOI 10.1007/s11284-005-0040-2

PREFACE

**Takashi Kohyama · Josep Canadell · Dennis S. Ojima
Louis F. Pitelka**

Forest ecosystems and environments: scaling up from shoot module to watershed

Published online: 31 March 2005

Terrestrial ecosystems are experiencing rapid changes of their structure and function as a result of an ever growing pressure by human demands on natural resources. Over the past decades, forcing by direct and indirect human activities has reached a point that is now rivaling the natural forcing that has shaped the Earth system over millennia. This unprecedented phenomenon has attracted a major investment by the scientific community to detect the impacts, attribute the changes to processes, and explore future trajectories. This scientific information is fundamental to creating the knowledge base that will inform policy development and will allow human societies to mitigate and adapt to these rapid changes.

With the goal of developing a novel research agenda in support to the above objectives, the "Global Change and Terrestrial Ecosystems" core project (GCTE, Walker et al. 1999; Canadell et al. 2005) was created in 1991 under the auspices of the International Geosphere-Biosphere Programme (IGBP). By contrast with other components of the Earth system, terrestrial ecosystems are constructed with short-lived and long-lived organic compounds with varied diffusivity, resulting in pronounced spatial and temporal heterogeneity. Up scaling and integrating to global scales of such heterogeneous ecosystems in relation to global environmental change has been described and forecasted through the GCTE research agenda.

Other aspects of heterogeneity come from hierarchical and compositionally diversified features of terrestrial ecosystems. Plants create a vegetation framework with organismic hierarchy, from cell physiology to whole individual-level regulation, and biological components at each trophic level characterized by biodiversity related to compositional functional differentiation. Therefore, GCTE has promoted the integration and the study of feedbacks between processes driven by plant and ecosystem physiology, population and community dynamics, and biogeochemistry.

The "Global Change Impacts on Terrestrial Ecosystems in Monsoon Asia" project (TEMA) (1995–2003) was the Japanese contribution to the GCTE global effort. Coastal East and Southeast Asia, as the target region of TEMA, are characterized by wet growing seasons influenced by monsoon climates, and species-rich forest ecosystems develop along a latitudinal gradient from equatorial to boreal zone, and an altitudinal gradient from lowland up to the forest limit (Ohsawa 1995). The TEMA aimed to predict the effects of environmental change on the distribution and structure of forest ecosystems in the target region (Hirose et al. 1998). Core parts of TEMA were designed to integrate forest ecosystem processes from leaf physiology to micro-meteorological budgets, and to predict long-term changes of vegetation composition and architecture through demographic processes. The TEMA paid particular attention to watershed processes, where forest metabolism affects ecosystem properties and biogeochemical budgets of freshwater ecosystems. This is particularly important because rivers, wetlands and lakes are experiencing direct and indirect effects of environmental change. The unique challenge of TEMA research was the attempt to integrate various scales of

T. Kohyama (✉)
Graduate School of Environmental Earth Science,
Hokkaido University,
Sapporo 060-0810, Japan
E-mail: Kohyama@ees.hokudai.ac.jp

J. Canadell
Global Carbon Project, Earth Observation Centre,
CSIRO Division of Atmospheric Research,
GPO Box 3023, Canberra, ACT 2601,
Australia

D. S. Ojima
Natural Resource Ecology Laboratory,
NESB, B229, Colorado State University, Fort Collins,
CO 80523-1499, USA

L. F. Pitelka
Appalachian Laboratory,
University of Maryland Center for Environmental Science,
301 Braddock Road,
Frostburg, MD 21532-2307, USA

IBOY: International Biodiversity Observation Year (2001-2002)
DIVERSITAS-IBOY: 119 hits (Google Scholar)

DIWPA: DIVERSITAS in the Western Pacific and Asia [Biodiversity Network]

IBOY Home | Research Site | IBOY Manuals | DATABASE | DB Manuals | Link & Site Map

IBOY Home

Program Description

Schedule for IBOY 2001

Program Description

Project Title

Network study on biodiversity in ecosystems on the Green and Blue Belts in Western Pacific and Asia

Leader(s)

Dr. Hiroya Kawanabe(Chairman of DIWPA, Director of Lake Biwa Museum)

Other Participants

Organizer

—Forest ecosystems—
Dr. Toda (Hokkaido University, Japan)
Dr. R. Kitching (Grifith University, Australia)
Dr. N. Stork (Cooperative Research Center for Tropical Rainforest Ecology and Management, Australia)
Dr. T. Abe (Kyoto University, Japan)
Dr. T. Nakashizuka (Kyoto University, Japan)

—Freshwater ecosystems—
Dr. M. Nakanishi (Kyoto University, Japan)
Dr. O Timoshikin (Limnological Institute, Russia)

—Coastal marine ecosystems—
Dr. Y. Shirayama (Kyoto University, Japan)
Dr. D. Gordon (New Zealand)
Dr. T. Nakashizuka (Kyoto University, Japan)

Science and Society

An International Biodiversity Observation Year

Diana Wall, Harold Mooney, Gina Adams, Geoffrey Boxshall, Andy Dobson, Tohru Nakashizuka, James Seyani, Cristián Samper and José Sarukhán

The International Geophysical Year (IGY), which took place between July 1957 and December 1958, helped us to rethink the world. At a time when there was a major paradigm shift in our understanding of the physical world, the international collaboration of the IGY helped to reset the discipline. The International Biodiversity Observation Year (IBOY) is now occurring at a time when our dependence on, and understanding of, biodiversity is being acknowledged as a paradigm shift in our present view of the world. Although the benefits of IGY were initially intellectual with practical effects remaining unknown until many years later, the benefits of greater knowledge of biodiversity will support efforts towards sustainability and affect the quality of life, both now and in the future. By providing the framework for international collaborations between scientists involved in every aspect of life on Earth, IBOY has the potential to redefine our current understanding of biodiversity in a manner similar to how IGY helped redefine the geophysical world.

January 2001 marks the start of the International Biodiversity Observation Year (IBOY), which is an initiative of DIVERSITAS, the international program of biodiversity science that seeks to promote and integrate the various dimensions of research. During 2001 and 2002, scientists, informatics specialists, the media and educators from across the world will collaborate to focus attention on biodiversity, its status and trends.

Why an IBOY?

Globally, biodiversity is being lost at all levels: (1) genes, species and landscapes that provide goods such as food, fuels, fibers and medicines; (2) ecosystem services such as purification of air and water and renewal of soil fertility; and (3) natural environments that provide a foundation for art, culture and recreation. As has been abundantly documented in the scientific literature, the rate of extinctions of plant and animal species has increased to between 50 and several hundred times the rates expected on the basis of geological data[1–3], with 50% of mammals and birds predicted to be extinct within 100–1000 years[3]. As Myers *et al.*[4] note: 'the number of species threatened with extinction far outstrips available conservation resources'.

Biologists generally believe that these losses represent a threat to the well-being of human societies[5] yet no sector of society is equipped with sufficient knowledge to evaluate this erosion of natural capital and its goods and services. Only a small fraction, ~1.75 million, of the 14 million species estimated to be on the planet, have been taxonomically described[6]. In addition, the distribution, abundance, status, trends and contribution to ecosystem goods and services of many of these species, not to mention the remaining 80–95% of species yet to be taxonomically described, are unknown. Awareness of biodiversity and its many connections to our daily lives is limited across the globe, thereby completely undermining the ability of the public and policy-makers to make decisions for sustainable development and conservation.

During IBOY, biologists, educators and media professionals will collaborate to collate and increase the availability of accurate biodiversity information that is essential for informed decision-making. In doing so, they hope to make the compelling, scientific case for increased general concern and action about losses of biodiversity. The ultimate goals of IBOY, as eloquently stated in Article 13a of the Convention on Biological Diversity (1992), are to: 'promote and encourage understanding of the importance of and the measures required for the conservation of biological diversity, as well as its propagation through media and the inclusion of these topics in educational programs'. Indeed, IBOY has the potential to achieve multiple goals.

Pushing the frontiers of science: the IGY model

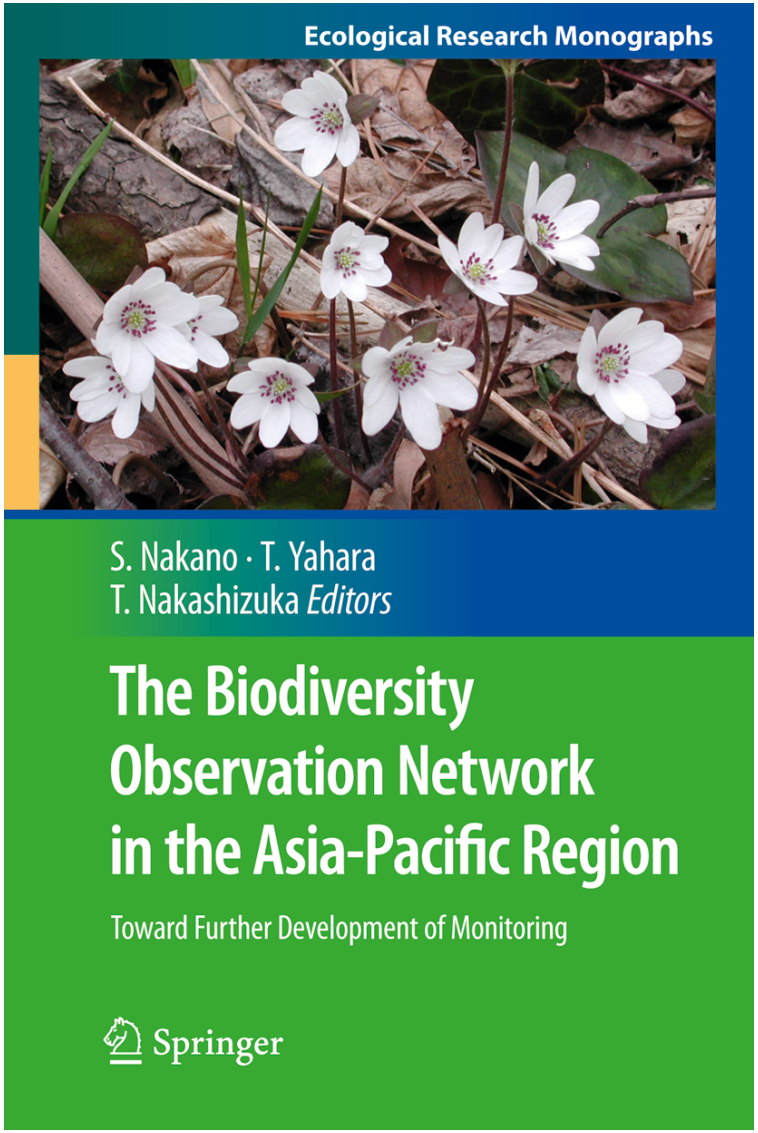
The IBOY was inspired in part by the enormous success of IGY which brought together many of the geophysical sciences to derive a more synoptic view of geophysical phenomena of the Earth and its atmosphere. Studies were made of the aurora, airglow, cosmic rays, geomagnetism, glaciology, gravity, ocean-floor soundings, the ionosphere, solar activity and, most notably, the ozone concentrations in the upper atmosphere[7]. The studies of ocean-floor soundings and the upper atmosphere led to our understanding of plate tectonics and the discovery of the Van Allen radiation belts, respectively. In a large sense, the IGY paved the way for space-age research.

Thus, the hallmark of the IGY was innovative geophysical science that integrated both scientific disciplines and global expertise. Longer term research efforts were also initiated, adding to the data gathered during the single intensive year. Furthermore, the IGY was a great unifying force for the relevant sciences, bringing together unprecedented cooperation among the world's scientists and even leading to a remarkable political gain: the Antarctic Treaty[8].

IBOY is set to play similar roles for biodiversity science, advancing our understanding of the nature and functioning of biological diversity, and conveying the importance of biodiversity to societal welfare. Projects within IBOY are exploring the frontiers of biodiversity – from the taxonomic diversity of the abyssal plains of the Atlantic Ocean to the dark and microscopic world in the soils beneath our feet (Box 1). Some projects are examining the relationships between biodiversity and ecosystem functioning from patch to landscape scales and others will identify biotic indicators of marine and terrestrial ecosystem sustainability. Many projects are combining previously fragmented datasets to provide new information on

http://tree.trends.com 0169-5347/01/$ – see front matter PII: S0169-534700)02046

AP-BON (Asia-Pacific GEO-BON)
First publication



- **Part 1: General Introduction**
- **Part 2: Networks for Monitoring and Research on Biodiversity in the Asia-Pacific Region**
- **Part 3: Establishing a Biodiversity Database**
- **Part 4: New Methods and Analyses for Biodiversity Studies**
- **Part 5: Biodiversity and Ecosystem Services**
- **31 chapters, 480 pages**

Scientific name: Dipterocarpaceae ***Shorea stenoptera*** Burck
No. 1
#

1st record

Scientific name: Rubiaceae ***Lasianthus*** aff. ***angustifolius***
No. 32
#

Pictured guide as an output of Plant Diversity Assessment

Scientific name: Fabaceae ***Bauhinia*** sp.
No. 112
#

Scientific name: Centroplacaceae ***Bhesa paniculata*** Arn.
No. 351
#

Last record

RIHN as a nodal institute of biodiversity research activities

Ongoing biodiversity-relevant activities:

● Diversity Program

Human Life, Aging, and Disease in High-Altitude Environments (OKUMIYA Kiyohito)

Collapse and Restoration of Ecosystem Networks with Human Activity (SAKAI Shoko)

Coastal Area Capability Enhancement in Southeast Asia (ISHIKAWA Satoshi)

Past biodiversity-relevant activities:

Effects of Environmental Change on the Interactions between Pathogens and Humans (C-06)

Sustainability and Biodiversity Assessment on Forest Utilization Options (D-01)

A New Cultural and Historical Exploration into Human-Nature Relationships in the Japanese Archipelago (D-02)

A Trans-disciplinary Study on Regional Eco-history in Tropical Monsoon Asia:1945-2005 (R-02)

Multi-Disciplinary Research for Understanding Interactions between Humans and Nature in the Lake Biwa-Yodo River Watershed (E-01)

Interactions between the Environmental Quality of the Watershed and Environmental Consciousness: With Reference to Environmental Changes Caused by the Use of Land and Water Resources (E-02)

Interaction between Natural Environment and Human Social Systems in Subtropical Islands (E-03)\

Communication effort:

How to teach children about biodiversity?

Edited by ABE Ken-ichi

Published by Showado, 2012

2,310 yen (tax included)

ISBN978-4-8122-1119-9