



# Master's Program in Environmental Sciences

# Doctoral Program in Sustainable Environmental Studies

Graduate School of Life and Environmental Sciences  
University of Tsukuba



# Master's Program in Environmental Sciences

Enrollment capacity: 84 persons; 2-year program; Degree: Master's in Environmental Science

## Message from Program Chair

Takeo Hama

We welcome students who are willing to expand their potential to be global leaders by exploring into the multidisciplinary world of environmental sciences in both classroom/laboratory and field settings.



## Our Vision in Curriculum

The Master's Program in Environmental Sciences is the oldest graduate school in environmental studies in Japan. Since its establishment in 1977, it has offered truly multidisciplinary curriculum choices to more than 3,000 students from twenty some countries. It has aimed to foster skills and knowledge for the students to become outstanding global environmental leaders/practitioners. Our graduates now contribute their skills/knowledge to governments, research/education institutions, NGOs, consulting companies, and other corporations.

One of three core courses in this Program aims to foster multidisciplinary and global visions by introducing wide-ranging environmental science topics that are approached from ecology, hydrology, chemistry, economics, ethics, policies, health, disaster prevention/mitigation/adaptation, and meteorology, among others. Another core course is based on field and laboratory practices that are accompanied with an in-class exercise course to enhance knowledge/skill acquisition in fields and laboratories. In addition, the Program offers more than 70 elective courses to meet diverse academic interests among students. Our acclaimed signature courses on international internships have offered hands-on seminars about ten countries in Africa, Asia, Europe, and North America.



## 2 Thesis Research

In this Program, every student becomes an expert in conducting thesis research and writing a master's thesis by forming her/his own committee, consisting of one academic supervisor and two or more sub-supervisors who help refine research topic/scope. In the middle of the second year, all students present their research progress in the interim presentation, in which other faculty members attend and help refine their researches. The master's theses are expected to make original/significant contributions to environmental sciences. Some of the past theses have been published in academic journals and books.

## 3 Admission

Admission is based on the submission of necessary documents (e.g., authentic English test score) and the result of entrance examination that is offered by the Program. A few different types of examination are available to meet applicants' diverse backgrounds. The detailed schedule for these examinations and application processes is available on the following website at <http://www2.envr.tsukuba.ac.jp/eng/masters-program-admission>. For all inquiries regarding entrance examination, please contact our office at [admission@envr.tsukuba.ac.jp](mailto:admission@envr.tsukuba.ac.jp).

	1 <sup>st</sup> Year		2 <sup>nd</sup> Year		Outcome
	1 <sup>st</sup> Semester	2 <sup>nd</sup> Semester	1 <sup>st</sup> Semester	2 <sup>nd</sup> Semester	
Research	<ul style="list-style-type: none"> <li>Program guidance</li> <li>Select academic supervisor</li> </ul>	Proceed with individual research for master's thesis		<ul style="list-style-type: none"> <li>Progress research presentation</li> </ul>	<ul style="list-style-type: none"> <li>Final thesis presentation and oral defense</li> <li>Master's thesis submission</li> </ul>
Courses	Compulsory core courses (3 credits):		Field survey and Internships / Laboratories		In total 30 credits or more (40 advisable)
	<ul style="list-style-type: none"> <li>Introduction to Env. Sciences</li> <li>Exercises in Env. Sciences</li> <li>Field and Laboratory Practices</li> </ul>	Thesis seminars in Env. Sciences (3 credits x 3 semesters)			
	Seminar in Env. Sciences (1.5 credits x 4 semesters)		Elective courses (12 or more credits)		

\* An academic year is divided into two semesters: Spring (April-July) and Fall (October-February).  
\* Early completion schedule is also available.





# Doctoral Program in Sustainable Environmental Studies

Enrollment capacity: 12 persons; 3-year program; Degree: Doctor in Environmental Studies

## Message from Program Chair

Maki Tsujimura

We welcome those who strive to be future innovators and help our civilizations achieve sustainable paths for development and the environment.



## 1 Our Vision in Curriculum

The Doctoral Program in Sustainable Environmental Studies aims to foster professionals and global academic leaders in wide-ranging disciplines that are related to environment studies. Students can refine professional skills that are essential in undertaking scientific studies or making policy/planning. They can also enhance practical skills for conducting field surveys or laboratory experiments. Throughout the Program, students are encouraged to connect their research interests to wider social and environmental needs for sustainability.

Every doctoral student in this Program forms her/his own advisory committee that guides research and ensures its publishable outcome as well as dissertation. The committee should consist of one academic supervisor and two or more sub-supervisors. In addition, a doctoral student is expected to make at least three presentations on research progress, which are evaluated by two or more faculty members other than advisory committee members in the Program.



## 2 Multidisciplinary Research Initiatives

The Program hosts a number of innovative research projects. Depending on academic fields, students join collaborative research projects with national research institutions outside the campus, including the National Institute of Advanced Industrial Science and Technology (AIST). Our faculty members also lead some large research projects that are funded by the Japan Science and Technology Agency (JST) and the Japan Society for the Promotion of Science (JSPS) as well as various other corporations.

## 3 Admission

To enroll in this program, a master's degree is required. Admission is based on the submission of necessary documents and entrance examination, which is offered by faculty members of the Program. For more detailed information about application and admission, please visit our website at <http://www2.envr.tsukuba.ac.jp/eng/doctoral-program-admission>. For all inquiries regarding entrance examination, please contact our office at [admission@envr.tsukuba.ac.jp](mailto:admission@envr.tsukuba.ac.jp).

## 4 Career Path

Many of our graduates have become faculty members or researchers at universities and research institutions in Bangladesh, China, Indonesia, Japan, Vietnam and Tunisia. Others work for national and municipal governments and private corporations like NTT Data and Toyota Motor Engineering & Manufacturing.



	1 <sup>st</sup> Year	2 <sup>nd</sup> Year	3 <sup>rd</sup> Year	Outcome
Research	<ul style="list-style-type: none"> <li>Decide supervisor and TAC* members</li> <li>Begin thesis research</li> </ul>	<p style="text-align: center;">Work on publication and conference presentations</p>	Preliminary thesis defense (TAC)	Doctoral defense (TAC) Thesis submission Publications
Courses	<ul style="list-style-type: none"> <li>Program guidance</li> <li>Decide AC and EC* members</li> </ul>	<p style="text-align: center;">Special Exercise of Sustainable Environmental Studies I, II, III ( under the supervision of AC and EC*)            Forum courses on Sustainable Environmental Studies I, II, III / Internships</p>		In total 7 credits or more

\* TAC= Thesis Advisory Committee; AC= Advisory Committee; EC= Evaluation Committee  
 \* Early completion schedule is also available.

# Certificate Program: Sustainability Science, Technology, and Policy (SUSTEP)

The Sustainability Science, Technology, and Policy (SUSTEP) certificate program is designed to foster global leaders with both specific scientific expertise and broader knowledge/insights in natural science, social science, humanity, and diplomacy/leadership. This program is collaboratively managed by the Master's Program in Environmental Sciences and the Doctoral Program in Sustainable Environmental Studies. It welcomes all graduate students and offers them a unique set of expert training courses with concentration areas called "majors." A SUSTEP certificate will be conferred upon the completion of required credits and theses. The latter should be conducive to the SUSTEP concept.

## 1 Majors

**(1) Environmental Hydrology and Disaster Prevention in Climate Change:** With its focus on hydrology and environmental disaster prevention/ mitigation/adaptation, this major fosters experts in the conservation and restoration of the watershed environment from climate change ramifications. Students can acquire advanced scientific and technical knowledge for alleviating human impacts on the watershed environment as well as optimizing local people's safety and security.

**(2) Ecosystems and Biodiversity Conservation and Remediation:** This major examines air/water pollution, deforestation, and natural disasters from the perspectives of ecology, soil science, microbiology, and analytical chemistry. Students can learn how microorganisms, plants, animals, and ecosystems have developed survival abilities through their defense mechanisms and remediated the environment. Researches in these areas can lead to innovative measures/discoveries for mitigating complicated environmental problems.

**(3) Integrated Resource and Waste Management:** This major offers advanced knowledge about available technologies and management systems that control and reduce waste generation. Its courses cover topics such as environmental information monitoring, environmental remediation technologies, environmental risk management, e-waste management, and human health risk from toxic waste.

**(4) Environmental Policy and Planning:** This major has the following four objectives: (a) to identify socio-economic and ecological factors; (b) to illustrate the mechanism of political trade-offs for conservation; (c) to propose adaptable options; and (d) to compose convincing ideas in planning.

## 2 Toward Global Leadership

Students in this certificate program are encouraged to place expert knowledge within multidisciplinary and global/local contexts by taking some common courses in addition to major courses. They also have opportunities to participate in international seminars and discuss global leadership on specific issues with guest experts from renowned research institutions and universities around the world. Here students in different majors come together and discuss/share their concerns and interests. These opportunities can lead to research innovation and global leadership visions.



# Internships and Seminars for Global Leaders



International Symposium



EDL Annual Symposium (completed)



Short-term Training

## International Seminars and Workshops

- Annual JDS International Symposium on Environmental Policy and Practice (2010-)
- Environmental Diplomatic Leader Annual Symposium (completed)
- “Meet the Leader” Special Seminars (completed)
- Ministry of Foreign Affairs (MOFA) Special Lectures (completed)
- Special Lecture on Global Environmental Issues and Japanese Diplomacy (completed)

## Available Short-term Training

- Short-term Education Courses on Environmental Sciences
- Short-term Research Training
- English Academic Writing Seminar



 SUSTEP Consortium Universities

 International Internship Destinations

## Faculty Members and Supervisable Research Topics

Faculty Name	Program <sup>1</sup>	Supervisable research topics
ADACHI Yasuhisa	M/D	Environmental colloid and interface engineering, flocculation and coagulation, colloid and interface in ecosystem, colloid facilitate transportation, water treatment, bio-colloid
ASANUMA Jun	M	Hydrometeorology, surface hydrology, arid hydroclimate, and water resource management
FUJII Sayaka	M	City planning/architectural planning
FUJIKAWA Masaki	M/D	History of dwelling environments in East Asia, preservation and renovation of traditionally built environments
FUKUSHIMA Takehiko	M	Environmental monitoring and modeling, lake environment management, sustainable development, sediments, water quality
HAMA Takeo	M/D	Aquatic ecology, ocean biogeochemistry, phytoplankton, ocean acidification, dissolved organic matter
HIGANO Yoshiro	M/D	Comprehensive evaluation of environmental policy and technology, regional environmental systems analysis, evaluation of mitigation measures against the global warming
HIROTA Mitsuru	M/D	Carbon cycle and greenhouse gases dynamics in terrestrial ecosystem, response to environmental change in alpine ecosystem, terrestrial ecosystem ecology, plant ecology, carbon dynamics, biodiversity, ecosystem function
HOTTA Norifumi	M/D	Forest engineering, watershed conservation, erosion control engineering, forest hydrology, sediment dynamics in mountain catchment, mechanics of debris flow
ISODA Hiroko	M/D	Food science, cell biology, food and medicinal plant, anti-aging, prevention of life style related disease, bio-resource, environmental risk assessment
KAIDA Naoko <sup>2</sup>	M/D	Environmental economics and policy studies, socio-economic valuation of natural and environmental resources, pro-environmental behavior analysis, sustainable consumption and lifestyle, environmental cooperation and ODA
KAJIYAMA Mikio	M	Synthetic study on material sciences, synthesis and properties of hybrid polymers
KAMIJO Takashi	M	Forest and grassland ecology, silviculture, forests, vegetation, biodiversity, the forestry, nature protection
KAWACHI Atsushi <sup>2</sup>	M/D	Environmental hydraulics, eco-hydrology, wetland conservation, groundwater salinization, GIS
KAWADA Kiyokazu <sup>2</sup>	M	Environmental agriculture and ecology, ecological diversity, natural resource conservation, geography, vegetation sciences, plant ecology, diversity
KOIKE Eiko	M/D	Environmental pollutants, biological effect, environmental medicine, toxicology, immunology
KUMAGAI Yoshito	M/D	Environmental biology, toxicology, epidemiology and preventive medicine, oxidative stress
KUSAKA Hiroyuki	M/D	Urban climate, Meteorology and climatology in local area, climate projection in regional-scale
LEI Zhongfang	M/D	Fundamental mechanism and design of new-developed waste (water) treatment and recycling technologies, wastewater treatment, biogranulation, N and P recovery and removal, heavy metals immobilization, biosolids
MASUDA Misa	M/D	Natural resource conservation, natural resource policy, rural development particularly in developing countries
MATSUI Kenichi	M/D	Environmental history/law/ethics, human/historical geography, water and biodiversity policies, indigenous/traditional knowledge, agricultural/water policies, water ethics, sustainable tourism
MATSUMOTO Hiroshi	M/D	Modes of action of agrochemicals and allelochemicals, responses of plants to photooxidative stress
MATSUSHITA Bunkei	M	Remote sensing, environmental dynamic analysis, water environment monitoring, land use/cover change, modeling
MIYAMOTO Kuniaki	M/D	Watershed engineering, water control science, natural disaster science, disaster prevention, flooding, flush flood/debris flow, volcanic disaster
MIZUNO Hideaki	M/D	Risk management of natural disaster
MIZUNOYA Takeshi	M/D	Environmental evaluation by simulation analysis, environmental economic policy, comprehensive environmental evaluation, expanded input-output modeling, environmental technology evaluation, integrated watershed management
MURAKAMI Akinobu	M/D	Landscape planning, urban and rural planning, urban heat island, urbanization and environmental change, planning history
NAGASHIMA Tatsuya	M/D	Regional air pollution, global warming, stratospheric ozone, air pollution, transport of atmospheric constituents, atmospheric chemistry-climate interaction, atmospheric chemistry modeling

Faculty Name	Program <sup>1</sup>	Supervisable research topics
NASAHARA Kenlo	M/D	Remote sensing, ecology, watershed management, disaster management
NISHIMOTO Haruo	M/D	Policy of natural disaster prevention, strategy for natural disaster prevention
NOHARA Keiko	M/D	Environmental chemicals, molecular toxicology, arsenic, cancer, epigenetics, mutation
NOMOTO Shinya	M/D	Organic geochemistry, geoorganic reaction chemistry, natural product chemistry, peptide chemistry
NOMURA Nobuhiko	M/D	Bacterial cell-cell communication and bacterial biofilm, applied microbiology
OHSAWA Yoshiaki	M	Urban planning, regional science, socio-economic planning
ONDA Yuichi	M	Geography, natural disaster science, forest science, transfer of Fukushima derived Cs-137 in the environment, soil erosion studies using fallout radionuclides, hillslope hydrology, water resources and forest management
SASAI Takahiro <sup>2</sup>	M/D	Terrestrial carbon and nitrogen cycle, ecosystem modelling, remote sensing, global warming, climate change
SATOH Shinobu	M	Plant physiology, injury responses, root functions, plant hormones, cell wall
SHIMADA Akihiko <sup>2</sup>	M/D	Evolutionary analysis of microbial metabolisms and their applications for bioremediation
SHINKAI Yasuhiro <sup>2</sup>	M/D	Environmental pharmaceutical science, toxicology, environmental chemicals, stress response, environmental biology, chemical biology
SUEKI Keisuke	M	Inorganic chemistry, nuclear and radiochemistry
SUGATA Seiji	M/D	Urban and regional air pollution, global warming, material transport in the atmosphere, observation data analysis, numerical simulation
SUGITA Michiaki	M	Hydrology, boundary layer meteorology, agricultural meteorology, evapotranspiration, ecohydrology, GIS
TAMURA Kenji	M	Soil science, environmental education
TANAKA Hiroshi	M	Weather and oceanic physics and hydrology, weather and climate, weather forecasting, atmospheric dynamics, general circulation of the atmosphere
TOYOFUKU Masanori <sup>2</sup>	M/D	Bacterial interactions and biofilms
TSUJIMURA Maki	M/D	Hydrology, water environment, water resources, groundwater, groundwater contamination
UEDA Hiroaki	M/D	Climatology and meteorology, climate dynamics, ocean dynamics, paleo-climate modeling, air-sea-land interaction, climate system
UENO Kenichi	M	Atmospheric science, natural geography, land-atmosphere interaction, precipitation system in Asian monsoon, snow cover and mountain weather
UTSUMI Motoo	M/D	Aquatic biogeochemistry and engineering, aquatic eco-engineering, biological water treatment, microbial ecology, biogeochemistry, C, N and P cycling
VILLAREAL Myra <sup>2</sup>	M/D	Pigment cell research (Melanogenesis and melanoma research) molecular biology
WATANABE Kazuo	M/D	Plant genetic resources, genetics, plant breeding, biodiplomacy, environmental ethics, sustainable rural development with biodiversity
WATANABE Mamoru	M/D	Life history of butterflies and odonates, conservation ecology
WATANABE Shun	M	Architectural planning, environmental design, CAD, GIS, CG
YABAR Helmut	M/D	Environmental engineering and management, integrated resource management, environmental policy and technology innovation, scenario design towards a sustainable Asia, waste management systems
YAMAJI Keiko	M/D	Environmental chemical ecology, root endophytes, secondary metabolites, chemical ecology, environmental stress, plant defense
YAMAMOTO Sachiko <sup>2</sup>	M/D	Architectural and regional planning
YOKOI Tomoyuki <sup>2</sup>	M/D	Evolutionary ecology of plants-insects interactions, pollination service, pollination, invasive species, bee, satoyama, behavior
YOSHINO Kunihiro	M/D	Environmental impact assessment, ecosystem service study, watershed land-use planning, rural environmental planning, food security, agricultural engineering
ZHANG Zhenya	M/D	Bioresource process engineering, biomass conversion, bioenergy production, organic waste recycling, functional food material development

<sup>1</sup> Programs that faculty members can supervise.

M=Supervise master's students

M/D=Supervise master's and doctoral students

<sup>2</sup> Available as sub-supervisors

## Current Doctoral Students



Ms Miki Toda, doctoral student, conducts field research in the Peruvian Amazon. Her research aims to assess the contribution of medicinal plants to local livelihood and health.

Mr Satoshi Tagata, doctoral student, undertakes hydrological monitoring at Miyakejima volcano, which erupted in 2000. His research aims to clarify the runoff process on the new fine-tephra mantled slope.



Mr Nguyen Hong Son, doctoral student, conducts research about the involvement of multiple stakeholders in solving water pollution in the industrial areas of Vietnam.

## Our Graduates

Dr Yudi Setiawan studied land use change in Java, Indonesia (2013). His study received ISPRS best paper award in 2011. He is a post-doctoral researcher at Nihon University.



Picture description: *Conducting interviews to validate scientific data.*



Dr Anis Chekirbane studied the interaction between groundwater and saline surface water in an alluvial coastal aquifer in Tunisia. He is an Assistant Professor at the Water Researches and Technologies Center, Borj Cedria Technopark, Tunisia. He is involved in some research projects dealing with groundwater resources in Tunisia and he is teaching "Groundwater Hydraulics" in the University of Bizerte, Tunisia.

Picture description: *Measuring the water level in a well in Siliana watershed, Tunisia.*

## Graduates' Career Paths

### Bangladesh

- Bangladesh Bank
- Ministry of Forest and Environment
- Ministry of Public Administration
- Bangladesh University of Agriculture

### China

- Beijing Foreign Enterprise Human Resources Service Co., Ltd.
- Chinese Academy of Sciences
- Chinese University of Geosciences
- Chongqing Municipal Administration Commission
- Highchem Co., Ltd.
- Lidyarich Financial Group
- Qsinghua University
- Tianjin University
- Toyota Motor Engineering & Manufacturing Co., Ltd.

### Indonesia

- Bogor Agricultural University

### Japan

- IC Net Ltd.
- Hitachi Systems Ltd.
- SystemEXE, Inc.
- Swing Corporation
- Chevron Japan Ltd.
- Ministry of Foreign Affairs
- Ministry of Environment
- National Institute of Agro-Environmental Sciences
- National Institute of Advanced Science and Technology
- Riken
- Japan Atomic Energy Agency
- University of Tsukuba
- Gifu University
- Kita Kyushu City
- Forest Research Institute of Hokkaido
- Forestry and Forest Products Research Institute

### Mongolia

- Mongolian Agency for Standardization and Metrology
- Adventist Development and Relief Agency
- Mongolian Academy Sciences
- Institute of Meteorology and Hydrology
- Ministry of Nature, Environment, and Green Development

### Tunisia

- Water Researches and Technologies Center, Borj Cedria Technopark

### Vietnam

- Cityneon Vietnam Company Ltd.
- Ministry of Natural Resources and Environment
- Ministry of Agriculture and Rural Development
- Hanoi University of Agriculture
- Vietnamese Academy of Agriculture Sciences
- Institute of Meteorology Hydrology and Environment
- Centre for Agriculture and Forestry Planning and Designation
- Hue University of Agriculture and Forestry

## Contact

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